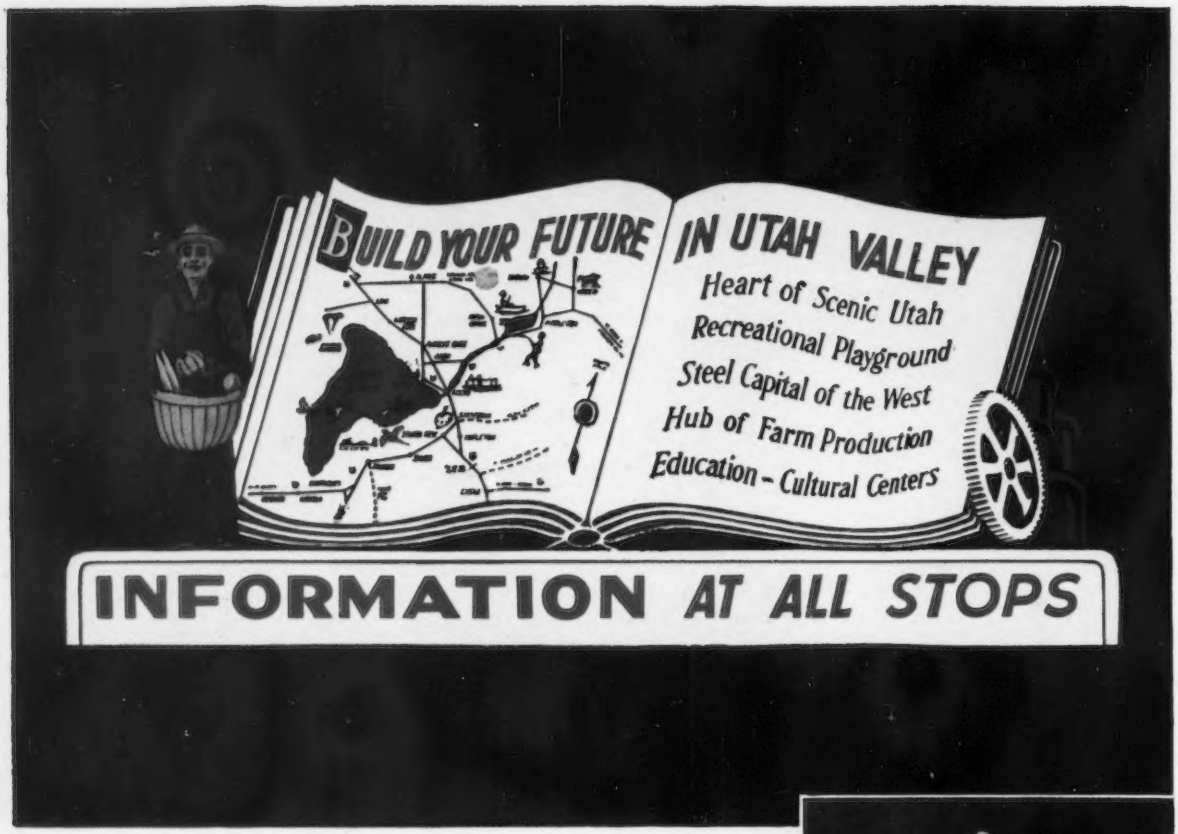
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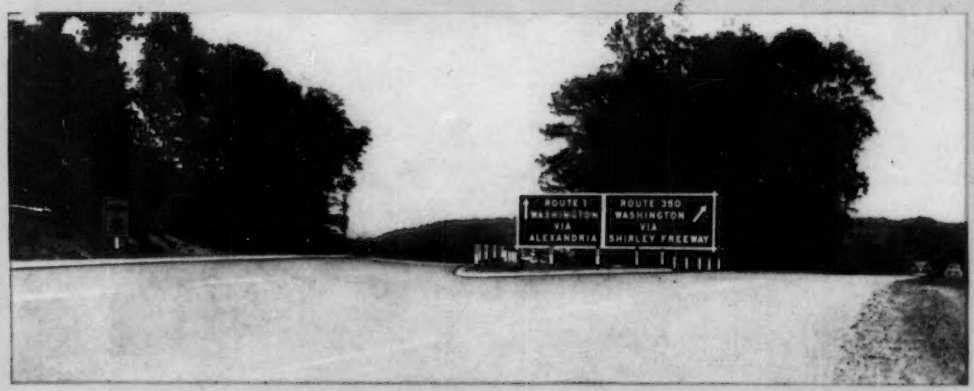

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Traffic Engineering

OFFICIAL PUBLICATION OF THE INSTITUTE OF TRAFFIC ENGINEERS

VOLUME XXIII | MARCH, 1953 | NUMBER 6

COVER: This is a model of the 12 million dollar Bay-Fair Regional Shopping Center proposed for Oakland, California, of which Victor Gruen is the architect. Mr. Gruen, one of the foremost architects in the field of shopping center design, is credited with many successful suburban and regional shopping center projects on the west coast and more recently in other parts of the nation. He is the architect of the 20 million dollar Northland regional shopping center project now under construction at Detroit, Michigan, for the J. L. Hudson Company. His article on the traffic engineering aspects of such developments appears in this issue.

Traffic Engineering is that phase of engineering which deals with the planning and geometric design of streets, highways, and abutting lands, and with traffic operation thereon, as their use is related to the safe, convenient, and economic transportation of persons and goods.

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May We Offer . . .

Traffic Impact of the Regional Shopping Center 191
Victor Gruen

Make Traffic Signals Move Traffic—Not Stop It 195
Karl A. Bevins

Traffic Trends 197

State Assistance in the Development of Freeways and Major Arterial Routes in Urban Areas in Texas 198
M. V. Greer

Truck Weighing Stations in North Carolina 200
James S. Burch

Open Discussion 202

Traffic News 204

Positions Available 213

New Appointments 215

Looking Ahead 216

Section News 217

Secretary's Column 219

Index to Advertisers ..... Inside Back Cover

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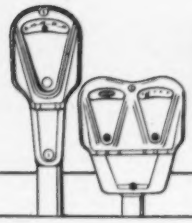

PARKING METER NEWS

FACTS EVERY CITY GOVERNMENT SHOULD KNOW

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Another Dual Meter runs equivalent to 86 years' service without failure

CANTON, OHIO—Results of a special acceleration test made on a Dual Model "GS-2" Automatic Meter are now available to municipal governments. These scientifically controlled tests, under the direction of Mr. Paul Janson of the Dual Engineering Department, were conducted at room temperature with the aid of an "acceleration machine".

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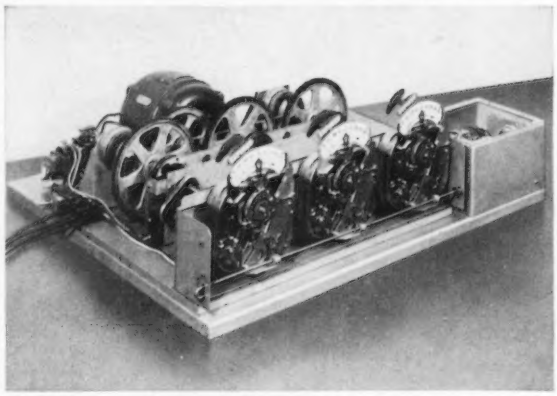
With the exception of excessive wear on one gear, caused by the motor-driven automatic winder, there was every indication that the meters could have run much longer.

Dual Meters Tested Under Severe Element And Weather Conditions

Canton, Ohio—The Dual Parking Meter Company reports that Dual meters are constantly tested in the company's laboratories under extremes in simulated weather conditions and the exposure to corrosive elements. Recent tests include a salt spray test and a weather stamina test. Results of these interesting tests were excellent according to Mr. Paul Janson of the Engineering Department, and are available to city governments on request.

THE DUAL PARKING METER COMPANY
A subsidiary of The Union Metal Manufacturing Company
Canton 2, Ohio

Tests Simulate Actual Operating Conditions



At the end of the three months' test—equivalent to 94 years of normal street operation—gears and moveable parts were checked and showed little sign of wear. Many of the parts, including the Seth Thomas mainspring, still met the rigid specifications of a new meter.

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Frankly Speaking

THE PRIMARY OBJECT of a municipality's street and highway systems is to provide the needed facilities for the most economical, feasible and efficient transportation of *people* and *goods*. In order to accomplish this it follows that:

1. the system be so designed and executed that maximum use of transit's inherent capabilities on the ultimate street and highway system may be obtained, and

2. transit, consistent with sound economic and operating practices, operate the most convenient and rapid service on the proposed facilities as they become available.

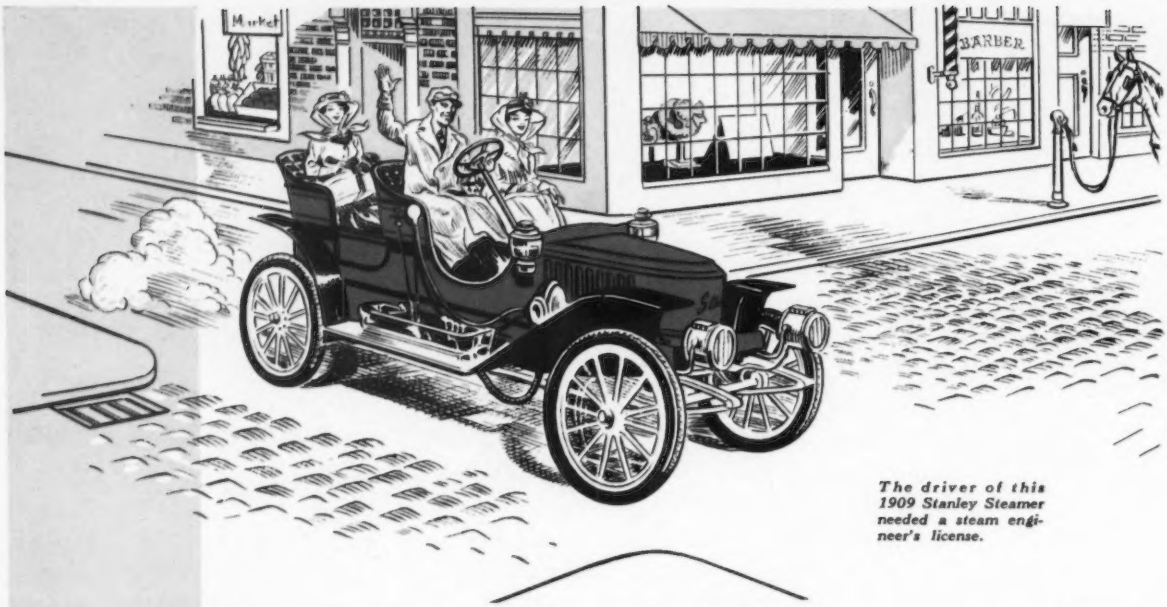
Achieving a better balanced use of transit will tend to relieve congestion and obviate part of the need for enlarging parking, street and highway capacity. This will enable municipalities to make substantial savings in their highway and street construction programs.

The attainment of this goal will require the sustained and cooperative efforts of all interested parties. It is encouraging that many traffic and highway engineers, city officials and planners are appreciating the basic importance of these facts. Many surveys, studies and proposals currently under way all now give major recognition to them.

But planning and engineering alone will not solve the problem. A thorough realization of the economic factors in wages, contractual labor working conditions, fare structures and adjustments are necessary by all parties concerned if transit is to operate adequately in the public interest on these improved highway facilities.

John B Ecker.

Director.



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Traffic Impact of the Regional Shopping Center

By Victor Gruen (Mem., American Institute of Architects)
Architect, Victor Gruen Associated Architects and Engineers,
Detroit, Los Angeles and New York

Introduction

The entire June, 1952 issue of PROGRESSIVE ARCHITECTURE was devoted to a study of "shopping centers—the new building type" written and arranged by Victor Gruen, Architect, and Lawrence P. Smith, Real Estate Consultant; and their staff associates. This comprehensive study of the many factors influencing the development of the modern day shopping center concept—which in itself is one of the latest evolutions of the mechanized civilization beginning at the turn of the century—is so informative that it is rapidly assuming the status of a standard reference work on shopping center construction.

As a prologue the PA editors wrote:

This issue of PROGRESSIVE ARCHITECTURE, devoted to a study of the planning of shopping centers, was prepared very much in the same manner in which shopping centers are created—by team work. An architect and a real-estate economist are responsible for the basic concept. Much of the writing and the co-ordination of the material was also done by them. However, their associates have contributed materially, by writing chapters, by preparing drawings and sketches, and by taking part in round-table discussions held on many occasions over many months.

The cumulative experience of the contributors is tremendous. Since he came to New York, in 1939, Victor Gruen, architect with offices in Los Angeles, Detroit, and New York, has been active in store design. In this field he has been a pioneer; many aspects of modern store design have been introduced by him in projects which range all the way from intimate shops to department stores. Gruen early turned to shopping center design as a potentially new field of architectural expression, and in recent years he has designed many neighborhood centers, suburban centers, and regional centers. Larry Smith, real-estate economist and consultant, has a background of real-estate experience going back to 1917, as well as private business experience; working in recent years in a professional capacity as consultant for shopping center projects, for investment companies, insurance companies, department store organizations, and private investors. He is regarded as one of the outstanding authorities in the shopping center field.

Relative to teamwork the article points out:

When Victor Gruen and Larry Smith started to work on this issue, the members of their organizations were asked the question: who is more important and who, therefore, should co-ordinate all work for shopping center planning—the economist or the architect?

One of the economists answered, "The ultimate goal of the owner is to build a satisfactory financial statement—and, only incidentally, some buildings. Therefore, the economist should be in full charge."

One of the architects answered: "A poorly planned center, uninviting in appearance, erected in accordance with no matter how brilliant an economic analysis, would be a failure. Therefore, the over-all responsibility should be the architect's."

They both have a point. It is unquestionable, as the economist has stated, that the primary aim of a commercial project is realized profit. To arrive at such realization, two factors must be present: the market potential and the correct tapping device. The analyst will detect, forecast, evaluate the potential. The architect will design the most efficient organic and economically sound environment for marketing—the most effective tapping device he can achieve for the given potential.

These two central figures of the team should be associated with a large number of teammates: civil, structural, mechanical, and electrical engineers; traffic planners; merchandising analysts; landscape designers; leasing experts, and many more. All these team members must exhibit infinite patience, straightforward thinking, and comprehensive understanding in co-operating with each other, with the owner, with city and state authorities, financing institutions, highway commissions and, last but not least, with the tenants.

The article ends with:

in conclusion

We—the Authors and the Editors—hope that this issue of PROGRESSIVE ARCHITECTURE has offered something helpful and useful in understanding the problems raised by that new building type, the shopping center. In conclusion, we would like to re-emphasize three points:

First, there has seriously been a desire to avoid definite "instructions" and dogmatic statements. If there is anywhere an appearance of such, it should be taken as a case study of one more project, rather than a general rule to be followed.

Second, interrelationships of factors are so important, especially in the economic aspects of shopping centers, that one can easily change another. For example, even the "trade area" cannot be defined except in relation to the physical design, and the selection of tenants.

Finally, the point made in the opening pages of the issue—that a modern shopping center can be a cultural and social center as well—may have been lost in the technical discussion through the study. This important aim should not be lost sight of: if it has not yet been attained in any completed center, it remains a possibility and a goal to work for.

TRAFFIC ENGINEERING realizing that traffic engineers—both operational and planning—are vitally concerned and deeply interested in the problems created by these new traffic generators prevailed on Mr. Gruen to prepare this article on the influence of shopping center development upon existing traffic patterns—Editor.

Victor Gruen

THERE ARE MANY PROBLEMS INVOLVED in the planning and construction of a shopping center and one of the more important is that of providing for a smooth flow of traffic to, through and away from the shopping center. A shopping center is almost wholly dependent upon auto borne trade and the extent to which traffic facilities are provided can be the difference between a marginal or a successful operation. The intensity of the problem will vary with the size of the center—the small neighborhood center may create little or no noticeable effect even at the corner on which it stands, while the regional center with 300,000 to 1,500,000 sq. ft. of store space can cause serious congestion several miles from its site.

Fig. 1
Model of the Northland center under construction at Detroit, Michigan.

The opening of a regional shopping center of 500,000 sq. ft. will divert approximately 10,000 cars per day from the existing traffic pattern. This diversion will extend throughout the entire trade area and, during peak periods, when as many as 3,000 cars per hour are pulled from their normal routes, the consequences can range from little or no effect near the outer fringe of the trade area to impossible congestion of the existing road net near the shopping center. Nearly every regional shopping center now in operation is experiencing some degree of traffic difficulty. Some proposed sites are being abandoned due to expected traffic problems. Others, now in planning stage, are faced with the alternatives of accepting extreme road congestion with its consequent loss of trade or the expenditures of huge sums of money for highway improvements.

Since smooth traffic flow and adequate parking facilities are two of the primary reasons for the shopping center's existence, highway congestion cannot be accepted as inevitable. Public road congestion with its consequent reduction in business volume can make the shopping center a poor investment and, as such, it either will not be built or, if built, it will deteriorate and all of its many advantages to the community will be sacrificed in favor of the marginal strip developments which now harass the motorist on nearly every main street in nearly every suburb.

Neither can public and highway officials accept the congestion. They are, by the positions they hold, bound to solve all traffic problems within their capabilities and to the extent of the funds made available to them. Their desire to cooperate has been evidenced in every project we have been associated with but their efforts during the planning stage have been hampered by: (1) the lack of funds which can be spent to alleviate traffic congestion which is not yet in evidence, and (2) the lack of statistical data on which to base an analysis.

The traffic problems created by a regional shopping center *are* new. This traffic is highly specialized in nature. It cannot be compared with downtown situations where there is a blend of shopping, business and commuter traffic aided, in most cases, by an integrated public transit system; it is not similar in habit to the traffic generated by the suburban strip or corner development; and, of course, it is very unlike the traffic created by large business or industrial units.

Since a shopping center does not have a slow, evolutionary growth but, instead, emerges full blown on opening day, its problems cannot be solved by periodic traffic counts from which future growth and highway needs can be projected. A delayed improvement program makes necessary land acquisition doubly difficult and expensive, temporarily increases the congestion and seriously hampers the center's operation. An extended limitation on the center's operation can have the effect of a reduced evaluation with a subsequent reduction in tax returns. If a realistic program of road improvement can be evolved and put into effect during the planning stage of the shopping center so that the sudden revision in the existing traffic pattern is balanced with the facilities provided, the regional shopping center can then assume its important role in the community.

The seriousness of the problem will vary with each individual shopping center. A detailed and careful analysis is required of any site on an individual basis and very few generalizations can be made which would apply to all. The factors to be considered in undertaking an analysis are:

A. The trade area.
B. The size and quality of the proposed center.
C. Volume and characteristics of expected trade.
D. Shopping center traffic characteristics.
E. Terminal facilities.
F. Characteristics of the existing traffic pattern.
G. Highway financing.

A. The Trade Area

As the name implies, the trade area is the area from which the shopping center can expect some degree of trade. Ordinarily, this area is divided into primary and secondary zones—the primary area is the close-in zone within which the center can expect to do a substantial portion of the food and drug business and the secondary area is more remote and its patronage will be in the apparel, furniture, general department store and other lines customarily bought farther from home. The size of the trade area depends mainly upon three factors:

1. *The Size and Quality of the Proposed Center.* The larger a center is, and the stronger its tenants are, the greater is the distance over which it can attract trade.
2. *The Local Trade Habit.* The existing pattern of trade prior to establishment of the center can influence the size and shape of the trade area due to existing competing retail districts.
3. *Traffic Access.* The trade area is closely related to driving time. A trade area will be extended along those routes which provide good, fast moving access and will be diminished along the routes which are devious, slow moving or congested. Seldom does a trade area extend beyond a 30-minute driving time line.

B. Size of the Shopping Center

The size of the shopping center is governed by the same factors as the trade area. Actually, the size of the center and its supporting area are so closely interrelated that one cannot be determined without the other. The shopping center must be of sufficient size as to attract trade from all parts of the trade area and the population within this area must be sufficient to support the size of the center.

The economic analysis necessary to size a proposed shopping center and delineate its trade area boundaries is extremely complex. For any shopping center large

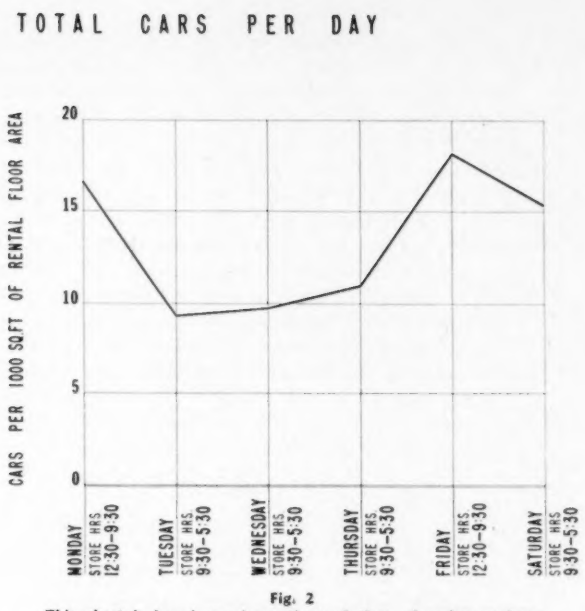


Fig. 2

This chart is based on observations of three shopping centers. It shows the average number of cars visiting the center each day throughout the shopping week. The observations were made at a time of normal operations, that is, there were no sales or special seasonal selling events.

enough to warrant detailed consideration of its anticipated traffic problems, an economic analysis must be made by qualified economists if other planning is to be realistic.

C. Volume and Characteristics of Expected Trade

Although the volume of trade is mainly governed by the size of the center, varying economic potentials may affect the dollar volume of trade. Whereas two centers may each be 500,000 square feet in area, one may enjoy average sales of $70 per sq. ft. while the other averages $55 per sq. ft. This is not to say, however, that the one center will necessarily attract traffic proportionately greater. Part of the dollar sales increase may well be absorbed by the characteristics of the center's trade.

While trips to the shopping center from the primary area for foods and drugs may average two per week or even higher, trips from the secondary area for apparel and furniture may average only one per month. Certain merchants, such as florists or stationers, may do a considerable portion of their trade by telephone. Although these trade characteristics as reflected in the store types can influence the expected volume of traffic, in practice, traffic expectancy is seldom analyzed on this basis. Aside from the complexity of such a so-called "experience ratio", the opportunity for serious error is possible when dealing with so many unknowns—unit sale, trips per week, customers per car, etc.

A simpler and more realistic technique is the comparative method which compares a proposed shopping center with several other shopping centers already in operation in order to estimate the expected traffic volumes and parking demand. In most cases, such an estimate cannot be a straight comparison. Adjustments will have to be made based on relative characteristics. Although two centers may be identical in size and store make-up, cumulative differences due to such factors as walk-in trade, public transit systems, sales volumes, customers per car, size of primary trade area in relation to secondary area, etc., can result in extreme variation.

D. Shopping Center Traffic Characteristics

The traffic generated by a regional shopping center is unique in character.

Volume: Under normal circumstances and depending upon local conditions, a shopping center containing 500,000 sq. ft. of rental area can attract an average daily volume of from 5,000 to 8,000 cars. (See Fig. 2.) On Saturdays and on those days when the center has evening shopping, this daily volume can increase to between 8,000 and 13,000 cars. Christmas season peaks have been known to exceed the normal operations by as much as 90%.

Although a wide difference exists in the daily volumes, there is an amazing similarity in the hourly traffic fluctuations within any given total volume. (Figs. 3 and 4.) We have found it possible to construct, from collated observations, a mean curve representing the operations of a hypothetical shopping center which we use as a norm. By an evaluated comparison of a proposed shopping center with this norm, a reasonable estimate of expected operations can be made.

E. Terminal Facilities

This term applies to parking facilities and those facilities provided to take the traffic from and return it to the public roads. The importance of these facilities cannot be over-estimated. If the traffic handling provisions within the site are inadequate, this will surely be reflected on the critical boundary roads and neighboring intersections. In order to maintain a smooth and even flow of traffic, the terminal facilities must be designed to the following criteria:

1. *An Adequate Parking Area*

   Enough stalls must be provided not only for normal operations but for special seasonal peaks. For normal shopping operations a regional center will require approximately five cars per 1,000 sq. ft. of rental area. During peak periods and special seasonal peaks, this ratio can reach 10 cars per 1,000 sq. ft. Rarely is it economically feasible or otherwise practical to provide high quality parking for this higher ratio, but it is necessary to provide overflow or emergency areas to absorb the seasonal increases.

2. *An Efficient Parking Area*

   It is not enough to provide the proper number of car stalls. The operation of the lot must be efficient. Narrow stalls will encourage, if not demand, straddle parking. The loss of space due to this false economy can result in a 15% reduction in theoretical parking capacity. Narrow aisles which are blocked during a parking or unparking maneuver can increase the number of cars moving within a parking area, from a normal 5% of those parked to a number sufficient to fill the aisles. If traffic backs up to the point where feeder roads become blocked, all car movement within the immediate area is stopped and open stalls, at this point, become useless.

3. *An Internal Distribution System*

   This system must be able to collect incoming cars from the various approach or boundary roads and distribute them to the parking area of their choice. Since cars will ordinarily leave in the same direction from

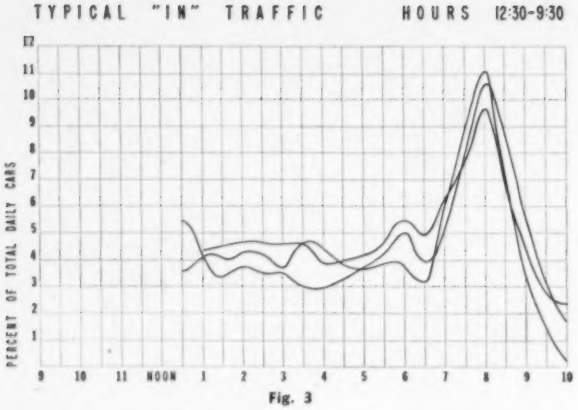


Fig. 3

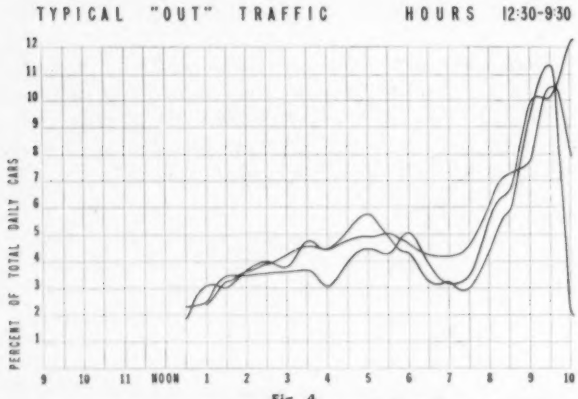


Fig. 4

These curves show the similarity in hourly fluctuation between three shopping centers of various sizes in different parts of the country. For a given daily volume, hourly traffic IN or OUT can be determined.

which they approach, the system must be able to function in reverse. Further, the internal road system must allow efficient by-passing of filled-to-capacity areas and encourage the use of those parking areas which might tend to be lightly used.

4. *Access and Egress*

The placement of entrances and exits can be the determining factor in the degree of congestion created on the public boundary roads and the interior distribution roads. Entrances and exits require a weaving, acceleration and deceleration distance between them. Ideally, this distance should be about 350′ to 400′. Under certain site limitations, this distance is sometimes reduced to 200′. Assuming a continuous traffic flow, an entrance or exit can handle about 750 cars per hour. Thus, it is evident that there is a definite relationship between the volume of traffic and the perimeter of the parking area. We call this the *contact area.*

The ratio of contact area to shopping center size will vary for individual site conditions. For example, the smallest possible ratio would apply to a shopping center site which was so located as to attract its trade equally from all sides along adequate access routes. This situation would result in equally balanced boundary road traffic. The number of exits and entrances could be determined simply by dividing the peak hourly loads by 750 cars and this number, multiplied by the desired distance between curb openings would be the required contact area.

We know of no site so ideally located. More often, traffic must approach over roads of unequal importance through a trade area of irregular shape and density. The highest ratio of contact area to shopping center size would apply to a site which could be reached from only one direction. Not only would the contact area be greater than one side of a well shaped site, thus requiring the construction of additional boundary roads, but, in addition, the traffic on these boundary roads would be unbalanced.

A simple mathematical calculation such as would be possible with balanced traffic would mean insufficient entrances and exits at critical points, a surplus along lightly travelled boundary roads. Some average would have to be applied as a safety factor since accurate predictions of boundary roads conditions are not possible. Then, too, the degree of congestion on the boundary road affects the capacity of the entrances and exits. The 750 per hour figure assumes a free flow in and out. A blocked boundary or interior road naturally reduces this volume. Even though complete and well planned terminal facilities are provided, they can and do become inefficient and wasteful if the public road facilities leading to them are over-burdened.

F. Characteristics of the Existing Traffic Pattern

Though tedious and time consuming, a survey of existing conditions is a necessary step in the analysis. Preliminary observations can usually detect those areas within the trade area which will be critically affected. In our own studies, we have not found the shopping center increases in traffic to be critical beyond 1½ or 2 miles from the site, although we can visualize certain access road conditions where critical situations would be created 5 miles from the site. For a regional shopping center, traffic counts must be taken for a full shopping week at all critical locations. A cordon count over this same period must be taken of the area immediately surrounding the site.

From these counts, unused capacities of the road net can be determined. These counts must be projected to the opening date of the shopping center. Thus growth rates and programmed street improvements must also be considered. Every effort should be made to estimate the percentage of this existing traffic which is solely shopping traffic, where it is from and where it is going. In most cases, unfortunately, this will have to be a guess. The figure is important because a portion of it, at least, is also a portion of the traffic which will visit the shopping center once it is in operation. A study of right-of-way widths, street widening possibilities and the feasibility of land acquisition will complete the survey of existing traffic. In most cities, counts made by the local highway authorities can be used to prepare a chart of month-to-month fluctuations.

Combined Traffic

By increasing the existing traffic loads to allow for normal growth during the construction period and adding to this the hourly volumes expected to visit the shopping center (minus those cars included in the street count which are being diverted, not added) a combined load for any given street can be approximated. First,

(Continued on page 202)

Make Traffic Signals Move Traffic - - Not Stop It*

By Karl A. Bevins (Mem., ITE)
City Traffic Engineer, Atlanta, Georgia

A paper presented at Michigan Traffic Signal Seminar, December 3, 1952, in Lansing, Michigan, by Mr. Karl A. Bevins, Traffic Engineer of the City of Atlanta, Atlanta, Georgia.

THE SUBJECT of traffic signals is one of my favorites. I would like to preface my remarks by saying to those of you who have visited the City of Atlanta, Georgia that the ideas which I express this morning represent our goal rather than what we consider to be our achievements to date. Like every large city, Atlanta needs many improvements in its traffic signal system. It is a pleasure to be able to report that Atlanta is making great progress in traffic signal improvements. The annual appropriation of funds for the purchase of traffic signal equipment has been increased from the $20,000 to $30,000 range to the $140,000 to $200,000 range. Two years ago the City embarked on an ambitious program for modernizing its traffic signal system. To date, we have concentrated on the interconnection of signals and the installation of modern timing equipment. Only our highest accident locations have received additional signal heads.

Now, let's get down to the business of this particular discussion. First of all, what is the function of a traffic signal? Why do we use traffic signals? What do we hope to accomplish? *The primary function of a traffic signal is the assignment of the right of way.* As a matter of fact, it is virtually the only function of a traffic signal. In other words, we install signals almost entirely for the purpose of assigning the right of way. Everything connected with the signal installation must be measured in terms of how well it accomplishes this primary function.

If traffic signals are used wisely, a number of advantages will usually accrue.

1. Traffic signals provide for orderly movement of traffic.
2. Traffic signals reduce the frequency of certain types of accidents. I would like to emphasize the "certain types of accidents" part of that last statement. For example, traffic signals as a rule have little or no effect on rear-end collisions. They tend to increase rear-end collisions, rather than decrease them. As another example, an ordinary two-phase signal will have very little beneficial effect on a head-on collision problem caused by traffic turning left at an intersection. Special provision must be made in the signal sequence if accidents resulting from the left-turn problem are to be reduced.
3. Signals can be coordinated to provide progressive movement—that is, allow traffic to move smoothly along a main street with very little stopping.
4. Under certain conditions, a signal can control speed. However, I do not believe that an isolated signal will control speed. It has virtually no effect on speed per se. An isolated signal frequently produces very beneficial results so far as accident reduction is concerned. The accident reduction, however, is the result of a combination of the assignment of right of way and the increasing of driver alertness. Two signals a block apart will not effectively control speeds. Three signals placed at intervals along a highway may control speeds. However, if they control speeds effectively, the chances are that they will not allow heavy volumes of traffic to move efficiently. Of course, there is the speed control type of signal which is vehicle-actuated and this particular piece of equipment will, when properly applied, control speed.

Karl A. Bevins

5. Traffic signals serve to interrupt heavy traffic at intervals to permit crossings along a main street.
6. Traffic signals offer many advantages as far as economy is concerned. The matter of police manpower is greatly eased by the use of traffic signals instead of police officers for the assignment of right of way at simple two-phase intersections. A signal will operate in all types of weather, rain or shine, snow or sleet. A system of modern traffic signals provides much better coordination for progressive movement than is possible with the highest trained squad of traffic police officers. Mechanical signals eliminate certain "human" factors—for example, the tendency of the officer to slow down after ten or fifteen minutes of strenuous traffic direction. They can also eliminate the tendency on the part of officers to wait for stragglers and wave them on through the intersection, thus unnecessarily delaying traffic on the cross street.

From this lengthy discussion, I think it is safe to draw the conclusion that traffic signals exert a very profound influ-

*This paper was presented to the 2nd Traffic Signal Seminar held at Lansing, Michigan, December 3, 1952.

ence on traffic. This influence is due to the more or less arbitrary action of the signal in assigning the right of way. Whether this action is due to the operation of a synchronous motor or vehicle actuation, it is in a sense very arbitrary. When properly applied, the traffic signal can result in safe, smooth traffic movement — in other words, very efficient traffic movement.

When improperly applied, excessive delays result. Disobedience to the signals is encouraged. This disobedience is a very serious matter because a traffic signal is one of the highest types of mechanical traffic control and is generally recognized as such by the general public. If we break down the driver's respect for this highest type of traffic control, think what happens to the driver's respect for the lowly STOP sign. Excessive delays due to improper application of signals on main streets force traffic to seek alternate routes. Frequently these alternate routes end up in residential sections where the presence of heavy through traffic is very undesirable. Heavy traffic on residential streets endangers the lives of children, causes vibration and noise, stirs up dust, and in general causes a deterioration of property values. Increased accident frequency is usually a direct result of the improper application of signals. Traffic seeking alternate routes that are not properly protected for heavy traffic usually results in an increase in accidents. Last but not least, disobedience to improperly timed traffic signals can easily lead to a general breakdown of the entire traffic control program.

This, I think, brings us logically to the attitude of the public toward a signal. The motorist likes to see green lights. He despises red lights. You yourself know that every morning on your way to work if you find a light green when you get to the main street, you like the operation of that signal. It is certainly doing a beautiful job. If it is red every morning, you may feel a little different about the matter. The pedestrian also likes to see green lights. He dislikes waiting. If he is made to wait more than fifty or sixty seconds, he becomes very impatient and unless traffic is extremely heavy, he may decide to attempt the crossing without the help of the signal.

Then, of course, we have the taxpayer. Incidentally, the taxpayer includes all of us; you and I pay taxes the same as the man who is sometimes on the other end of the telephone fussing at us and asserting that he is a taxpayer. All of us are interested in getting the most for our dollar, and I feel very sure that you and I are just as interested as anyone in getting the most for our tax dollar. So, it certainly behooves us to do everything we can to use this valuable tool, the traffic signal, in as efficient a manner as possible.

Let's not forget that we must measure the efficiency in terms of its primary function—that is, assigning the right of way. We dare not measure efficiency in terms of how much trouble we have keeping the signal operating, nor in terms of how complicated it may appear to us, as long as these problems are within reason. Many of us are prone to say, "No, I'm going to get a simple piece of signal equipment that just switches the lights from green to amber to red and back again—none of the 'fancy' equipment for me. It's too expensive to operate." Gentlemen, *is* it too expensive to operate? Or are we just too lazy to operate it? The answer can be found by using the primary function of the signal as a yard stick. Does it do the best possible job of assigning the right of way? For nearly every traffic situation, signal equipment is available. The present-day manufacturers of traffic signal equipment have many fine models to offer us. They are also ready and willing to develop new features as we need them.

Let's talk for a moment about the value of flexible timing. By flexible timing I mean having one timing schedule for signals as they operate during the morning rush, another one during the middle of the day, another one during the evening rush and possibly a fourth, fifth, or sixth timing schedule for use during other times of the day and on special days of the week. In Atlanta the trucking association has recently released a figure of 20 cents per minute for operating their trucks on the streets. In other words, they say that it requires an investment of 20 cents for every minute that a truck is rolling on the streets of Atlanta. Now suppose that we stop just one truck for a red light on a main street and nothing comes out of the side street and no pedestrian crosses; the truck sits there through the red light and is delayed, say, twenty or thirty seconds; suppose there are four such delays within a mile. Forty cents is lost. Think of how many miles the truck travels in a day. Think how the delay adds up. What about your time and my time and the time of the other business people who drive automobiles? What about the delay to the bus company and its patrons, taxicabs and their patrons? What about the irritation to the general public—stopping for red lights in isolated spots for no apparent reason, no traffic on the cross streets, yet the light is red? The driver has two choices, either sit there and waste time unnecessarily, or run through the red light and break the law.

Flexible timing will frequently enable the City to postpone the need for new facilities. Most cities today realize that they need far more new streets, bridges, underpasses, and overpasses than they can possibly build within the next few years. Traffic signals are relatively cheap; they cost only a few thousand dollars. For example, consider a four-lane street on which parking is permitted. With parking on each side of the street, there are only two lanes left for moving traffic. Suppose we find that an extra lane is needed on the street during the rush hours. That means building another street the same width or taking the parking off of the existing street or using an unusually long signal cycle during the rush hour and increasing the capacity of the street for carrying traffic without disturbing the parking. Many times the long signal cycle is within reason and very acceptable to the side street traffic if it is used only during the peak period. In this way we may postpone the need for the undesirable removal of parking or the expensive job of building a new street. There are many locations in cities today where improved signal timing could clear up congestion, and the cost would be only a few thousand dollars.

I mentioned at the beginning of my talk the matter of more than one signal indication per approach. If any of you doubt the value of having more than one signal indication per approach, I would like for you to take a short ride with me around the streets of some of our large cities. I will let you find some of the traffic signals for me. Believe me, gentlemen, some of them are well hidden. Sure, they are in plain sight, if you happen to be looking in the right direction. Frequently, there is only one little signal in a maze of trees, wires, poles, and electric signs, and the view of that little signal is often blocked by trucks and buses. The use of more than one indication is generally accepted by our more progressive traffic authorities. As a matter of fact, the standards call for a minimum of two indications for each approach

in urban use of signals. The use of additional signal heads costs very little and can go a long way toward reducing accidents at many high-accident locations.

Now, I am sure that many of you are sitting there and saying, "Yes, that's all fine talk, those are high ideals, but my mayor and council, my city commission, my purchasing committee, or my purchasing agent certainly won't go along with the purchase of all those fancy gadgets and extras. They keep us down to the bare necessities of life." Gentlemen, good traffic signals are among the bare necessities of life, and I mean LIFE, on our city streets.

Here is the justification for the "extra" initial cost. As public servants it is our duty to provide efficient service. Let me repeat—as far as traffic signals are concerned, the efficiency must be measured in terms of their primary function: What kind of a job does the signal do in assigning right of way? Do people still have difficulty in seeing the signals? Are they still being involved in accidents that can be traced to the lack of sufficient signal heads? Are delays excessive? What kind of observance do you obtain? Do people respect your traffic signals? Now, in order to discharge our duty as public servants in this matter we must use every effort to explain to our city fathers why it is economy to buy the best signal equipment. Anything less than the best is wasteful.

All of us, I am sure, spend many hours checking the life expectancy of certain pieces of equipment. Will this traffic signal timer last fifteen years, twenty years, twenty-five years? In other words, we worry a lot, and so do our city fathers, about how long this or that piece of equipment will last. We are interested in getting one that lasts a long time so that we don't have to replace it soon. All right—all the more need for looking at this matter of efficient assignment of the right of way.

Here is a small measure of the extent to which our traffic problem is growing from day to day. At the close of World War II in 1946, most of the traffic authorities in the country agreed that by 1970 traffic volumes would reach a certain figure. Gentlemen, it is still a long way to 1970 and traffic volumes in this country have already exceeded the figure which most of us predicted would be reached by 1970. If we are planning for equipment to last twenty years, let's be sure that we get equipment which will do an efficient job for twenty years.

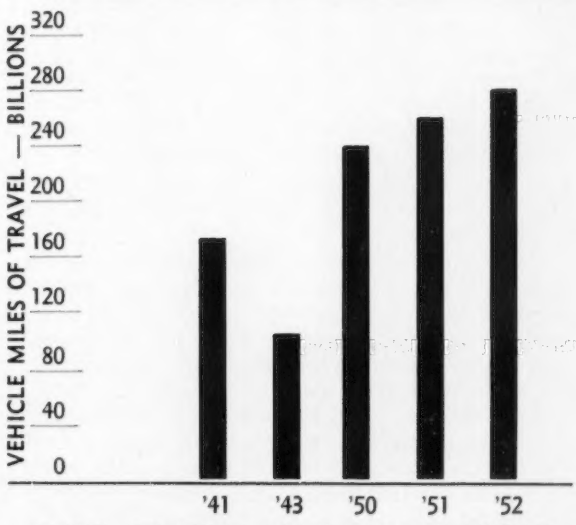
Accident costs, as generally estimated, run something like this: A fatal accident costs your community $11,500; an accident in which a person is injured costs your community $425; one in which only property damage is involved costs your community, on the average, $125. Now, we all know the cost of an extra traffic signal head, we all know the cost of cable, the cost of expansible timers and vehicle-actuated equipment. If the use of these devices will save one personal injury accident per year, the difference in cost between inferior equipment and the best is usually easily justified. Two or three property damage accidents a year that could be avoided by the use of good equipment will wipe out the difference in initial cost. The matter of time saving which was mentioned a while ago soon makes up the difference in cost between good and poor traffic signal equipment.

The motorist's attitude toward the traffic signal is all important in building safety on our streets and highways. Signal indications must appear to be reasonable if they are to be acceptable to the general public. We in the United States rebel against regimentation. The traffic signal, in a sense, attempts to regiment the drivers. If this regimentation becomes too harsh through unreasonable timing schedules, the public is going to rebel against it.

I am certain that if you were sent out to handle traffic at a busy intersection, you would attempt to assign the right of way on the basis of the relative needs of the two intersecting streets. You certainly would not stop heavy traffic on the main street and hold it for twenty seconds when there was no one on the cross street wanting to cross the main street. Yet how many of our traffic signals do exactly that, day in and day out? They stop traffic on the main highway, when there is no traffic on the cross street. One answer is the use of more vehicle-actuated equipment. What if you need a signal at every corner? Well, you can still use vehicle-actuated equipment with coordinating features. Or you may find, because of special coordination problems, pedestrians, or other factors, that synchronous motor equipment with two or three dials is more acceptable. Let's always keep in mind that we install the signals for one purpose, that is, to assign the right of way. Let's put the lights out where people can see them. Let's make it easy for them to find the signals so that they will not be trapped, and above all let's give them a reasonable timing schedule at all hours of the day.

Gentlemen, we are going to hear from several other speakers who will amplify the subject of the types of modern traffic signal equipment that are available today. As you listen to these speakers, let me present this challenge to you. Ask yourself during this seminar and after you return home, "Am I, as a public servant, doing everything within my power to insure that every signal installation made under my supervision is an installation which will give the most efficient service that is possible with mechanical equipment? Or am I taking the easy way out and allowing equipment to be installed which arbitrarily stops traffic, wastes my time and the time of my fellow citizens, and contributes to the accidents and congestion on our streets and highways?" In other words, gentlemen, let's be sure that we are installing traffic signals to help traffic move smoothly, safely, and efficiently.

Traffic Trends



TRAVEL ON RURAL ROADS FOR THE TWELVE MONTHS OF 1941, 1943, 1950, 1951 and 1952

Based on Bureau of Public Roads Data

23rd Annual ITE Meeting Paper

No. 16, Presented at the Second Technical Session which was devoted to the subject, The Economics of Traffic Planning; as participation in the Panel Discussion, Financing Street Transportation Plans, moderated by D. Grant Mickle; 3:30 P.M., September 10, 1952

State Assistance in the Development of Freeways and Major Arterial Routes in Urban Areas in Texas

By M. V. Greer (Assoc. Mem., ITE)

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STATE ASSISTANCE in the Development of Freeways and Major Arterial Routes in Urban Areas in Texas must as a first requisite be within the framework of State statutes governing the expenditure of State funds. The basis of legal authority to spend State funds on highway facilities within the corporate limits of cities, which include the major urban areas, stems from Senate Bill 415 enacted by the Forty-sixth Texas Legislature in 1939. This Bill empowers the State Highway Commission to enter into agreements with the governing bodies of incorporated cities, towns, and villages, providing for the location, relocation, construction, reconstruction, maintenance, control, supervision, and regulation of designated State highways within or through the corporate limits of such incorporated cities, towns, or villages, and to determine and fix the respective liabilities or responsibilities resulting from such agreements.

When the impact of the traffic problem began to make itself felt in the larger cities of the State in the early part of the decade beginning with the year 1940, the need for high type traffic facilities embodying the design principles of the Freeway came into sharp focus. It was evident that the cost of Freeways would be of such magnitude as to require participation by both the State and cities to finance their construction. Although the State had the authority to spend money on highway facilities within the corporate limits of cities, there was no existing legislation which empowered either the State or cities to construct a facility of the controlled access type.

Freeway legislation was something new to Texans and carried with it a lack of public understanding. There was fear in the mind of the individual that he would be entirely deprived of the right of access to and egress from Freeways since he had become accustomed through the years to an almost unlimited right of access to and egress from the ordinary type of public streets and highways. Public acceptance of Freeway legislation on a state-wide basis appeared very unlikely, but a Freeway law applying to a specific locality appeared to have an excellent chance of winning approval of the Texas Legislature. It remained, therefore, for one of the larger Texas cities to sponsor a Freeway law applying to cities in the population range of 293,000 to 375,000. The proposed law was introduced during the session of the Forty-eighth Texas Legislature in 1943 and was enacted as Senate Bill 95. Even before the end of the Forty-eighth Legislative Session, the Freeway law had gained the support of another large city, and it was amended to apply to cities having a population of over 293,000. When the benefits of such legislation began to make itself apparent through application in the two largest cities, public support began to grow, and the Freeway law was amended by the Forty-ninth Legislature in 1945 to include cities over 175,000 population; it was amended again by the Fifty-first Legislature in 1949 to include cities over 50,000 population; and finally it was amended and expanded by the Fifty-second Legislature in 1951 to empower the State Highway Commission or the governing body of any incorporated city or town within their respective jurisdictions to do any and all things necessary to lay out, acquire, construct, maintain, and operate any section or portion of any State highway or city street as a Freeway.

With the legal barriers removed by legislation, the way was then cleared for developing an organization within the Highway Department for the administration of the Freeway program. Actually, the organizational planning for the program began in 1943 when legal authority for such construction applied only to cities having a population of over 293,000. The chief administrative officials of the Highway Department realized that they were embarking on a new field of endeavor; they were fully aware of its magnitude, its complications, and its problems; and they knew that a vast amount of preliminary planning, a tremendous task of gaining public acceptance, and what appeared to be an almost insurmountable obstacle of adequate finances would be encountered. A careful study and evaluation of all these related and inherent problems led to the development of the Engineer-Manager type of administrative control which was to apply eventually for each of the four largest cities in the State.

The Engineer-Manager for Urban Freeway projects in each of the four largest cities was selected from within the Highway Department's organization on the basis of an unquestioned background of experience and the ability to assume a broad expanse of authority and responsibility in the field of highway engineering. His duties and responsibilities were outlined as covering all of the field of public acceptance,

detailed negotiations, advance planning, plan development, and construction. Outside consultants who were known to have a background of experience in other states and areas were employed to initiate the advance planning and to orient the thinking of the Department in the Freeway field of endeavor. The Department was short of engineers and designers in the inception of the program, and in order to expedite the work, engineering firms that had built up sizeable organizations during the war for government project planning and construction were utilized. The use of these engineering firms provided a time saving of approximately a year in moving the work to the construction stage and provided an interim for each Engineer-Manager to perfect his own staff for the preparation of plans and supervision of construction.

The Highway Department is proud of the success of the Engineer-Manager system of administration. The work has progressed rapidly and efficiently, and many sections of Freeways have been opened to traffic well ahead of scheduled completion time. To date, 27.6 miles of Freeways in the four largest cities, involving a cost of $34,672,000 in State and Federal funds, have been opened to traffic. An additional 18 miles of Freeways for these four cities are now in the planning or construction stage.

Public acceptance of Freeways constructed on wide, expensive right-of-ways furnished by the cities and leading into or adjacent to the central business districts has exceeded all expectations. In reality, the cooperation of the cities has not only kept pace with funds available for construction but has led the Highway Department by two or three years at every stage of the planning. No doubt, a large part of the public enthusiasm for Freeway facilities can be attributed to a safety record of 1.6 fatalities per 100 million vehicle miles and a travel time saving of 50 per cent over that of routes previously used by traffic which now uses the Freeway. Translated into monetary values, it is estimated that the time saved by users of the section of Freeway on which the travel time study was made will amount to about $11,000,000 in a period of four years, which approximately equals the cost of construction.

The finance plan for Urban Freeways in Texas is rather simple. The State and city governments join in the advance planning as well as the detailed preparation of project plans. All engineering cost is borne by the State of Texas. Right-of-way information is prepared by the State in conjunction with the city government. The city government, at its expense, secures a clear, unobstructed right-of-way for the project, including necessary adjustments of utilities, and participates in the cost of storm sewers to the extent of an agreed proportional share of storm waters entering the mains on a cubic foot per second basis. The remaining cost of construction is paid from State and Federal funds on a pay-as-you-go basis, and the State maintains the facility after its completion with its regular District Maintenance organization. The cost of illumination and its maintenance and operation is shared on a 50-50 basis by the State and city. In truth and in fact, the State of Texas and the cities of Texas are partners in the endeavor of Urban Freeway development, and both parties are proud of the part they have played in the success of this endeavor for the relief of traffic congestion in urban areas. There is no desire to dissolve this partnership, for it has developed a close liaison between the State and city governments in Texas that is unexcelled anywhere.

While the Freeway program basks in the limelight of the headlines and captures the public fancy, there are other types of State assistance in the construction of traffic facilities in urban areas that win the acclaim of only local citizens and public officials. These traffic facilities are the major highways into and through the smaller cities where traffic conditions will not justify Freeway construction. Such projects may be an arterial highway with intersections at grade and direct access to abutting property and on which geometric design and traffic control measures are used to expedite the safe movement of through traffic, or they may consist of the widening and improvement of an existing city street which carries a highway route.

The finance plan for arterial highways and street widening and improvement projects in Texas is very similar to that of the Freeway program. The State and city join in the advance planning. Right-of-way information is prepared by the State in conjunction with the city. All engineering is done by the State through the District organizations, and the costs are borne by the State. The city, at its expense, furnishes a clear, unobstructed right-of-way, including necessary adjustments of utilities, and pays the cost of curb and gutters and necessary storm sewers. The remaining cost of construction is paid either with State and Federal funds or entirely with State funds on a pay-as-you-go basis, and the State maintains the surface of the highway and its support after completion of the project. Where illumination is justified, the cost of the installation, maintenance, and operation is shared on a 50-50 basis by the State and city.

As a measure of the extent of State assistance in the development of arterial highways and the improvement of major city streets carrying a highway route in urban areas, the State spent approximately $54,139,000 between World War II and September 1951 in improving, building, and rebuilding a total of 221 miles of city streets. During those same years maintenance of 2,100 miles of traffic facilities in cities which carry highway routes cost the State $4,535,000.

In summary, the keynote of the general policies governing the State's assistance in the development of Freeways and arterial routes in urban areas is a feeling of joint responsibility between the State and cities for providing efficient facilities for automotive transportation, and only through the acceptance and discharge of such joint responsibility can the most efficient solution of the traffic problem in urban areas be achieved.

PLEASE MENTION

TRAFFIC ENGINEERING

When Writing to Advertiser

Truck Weighing Stations in North Carolina

By James S. Burch (Mem., ITE)

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Fig. 1
Photo of Truck Weighing Station near Wilson, showing scale house, paved storage lot, and the two weighing strips which are absolutely level. Driving axle of front truck is on platform scale. Strip on right is for auxiliary weighing, by means of special slot beam on loadometers.

With December's TRAFFIC ENGINEERING short article on New York State's truck weighing stations went an editorial invitation for representatives of other State highway departments to submit articles on this subject of so much concern to many States. TRAFFIC ENGINEERING appreciates Mr. Burch's response, and hopes we'll have the privilege of hearing from other states.

NORTH CAROLINA'S 1951 GENERAL ASSEMBLY, recognizing that truck weight law enforcement activity was not adequate to combat damage to highways and streets caused by excessive truck axle loads, took direct action for highway protection in two ways. First, it increased overload penalties and fixed the amounts of penalty on an ascending scale of "cents per excess pound". Second, it authorized the construction and operation of a statewide system of twelve enforcement truck weighing stations. This brief report deals with the second item.

Study

A statewide study of axle overloading and truck route patterns resulted in the selection of twelve sites, with further consideration being given to locations which would be difficult to by-pass, and which would have widespread effect on truck operation within the state (as contrasted to state border locations). For example, all stations are well within the state, and many locations are at rivers. About twenty-eight U. S. numbered routes pass these twelve stations.

Design

In the design, several features in addition to sight-distance and profile were taken into account and provided for. Where daily volumes were in excess of about three thousand V.P.D., the layout included scales on *both* sides of the highway, to avoid dangerous traffic conflict points and congestion.

Realizing that many illegally loaded truck units would likely be impounded simultaneously, a paved storage lot one acre in size was provided at each station. Additional property depth was acquired for expansion. Of course, all drives, scales and buildings were set back from the existing highway lines to provide space for future widening.

Approach drives were paved for a length of three hundred feet for deceleration and for waiting trucks. By-pass lanes within the station area were provided so that empty trucks and other vehicles which did not require weighing could be "waved through" without delay.

Scale

The platform chosen for the pit scale was 10′ x 10′ this being designed to weigh trucks by axles. It is a well known fact that the axle weight, and not the gross weight, is the criterion for highway damage, and it was considered highly advisable to emphasize the axle weight. Scale approaches were made absolutely level, for fifty feet on each side of the scale, and thus gross weights could be obtained by simple additions of axle weights. Provisions were made for future conversion to a three-scale design for simultaneous "one stop" weighing of all axles.

Fig. 2
Special slot beam scale resting on loadometers. The whole assembly normally rests in shallow pit built into concrete weighing strips. The author (left) is pictured with State's Assistant Commissioner of Motor Vehicles, Joseph W. Garrett, on right.

Double dial, direct reading scales were provided and given special dial lighting so that they could be read from inside or outside the scale house by officers, truck drivers, or anyone else, day or night. This "gold-fish bowl" idea was considered as a valuable public relations feature in dealing with the truck operators and owners. The scale rating was thirty tons, or almost double the legal limit for a tandem pair of axles. Each scale is provided with an automatic printer, so that any doubtful weight or violation weight may be accurately recorded on several copies of tickets, including one for the truck driver and one for court exhibit.

Scale House

A major scale house was built for each station, and at double stations, a small shelter house was provided on the opposite side of the highway (see Fig. 1). The major scale house consists of a scale room, an entrance or waiting room, an office, and a bunk room, together with a lavatory and a toilet. Thus, the station may be operated on a continuous twenty-four hour basis, and personnel may use bunks as necessary before or after night shifts. Outside spot and flood lighting is being provided.

Auxiliary Scale

In addition to the platform pit scale, each station is provided with one or two "loadometer slot beam" scales for auxiliary or supplemental usage (see Fig. 2). Scale accuracy may be checked at the site at any time by comparing the result of weighing the same axle on two scales of different types. Trucks may be weighed at the rate of one each 1 to 1½ minutes on each side of the highway. The ten completed stations are now working on a one shift per day basis, but together weigh more than 80,000 vehicles per month. It is planned to enlarge the operation to twelve stations on a twenty-four hour basis.

Personnel and Cost

The station complement is about four persons for a single station, and seven persons for a double station. All personnel are deputized as special officers, and work in uniforms. Stations were located, designed, built, and equipped by the State Highway and Public Works Commission at a total cost including property of about $25,000 for a single station and $35,000 for a double station. Stations are operated by the State Department of Motor Vehicles.

Fig. 3
North Carolina Officials watch as special loadometer slot beam scale is tested for 18000 lb. legal axle load with seventeen 1000 lb. and two 500 lb. solid cast steel test weigh blocks.

Resulting Benefits

Although the stations had been in operation for an average of only about three or four months, Highway Planning Survey data as of August 1952 showed a reduction of about thirty or forty per cent in the frequency of illegally loaded axles during day-time and evening hours. No reduction was noted, however, in the midnight to 8 A.M. period, when stations are closed. It is believed that further daytime reductions have since occurred.

Generally, all passing trucks, even though small or empty, are passed through the station area for quick examination or weighing. There is very little delay to any legally loaded truck, due to the deceleration lanes, automatic scales, bypass lanes, plenty of space, and with double stations at high volume locations.

Perhaps the major benefit has been derived through a better understanding of truck axle and gross weight laws on the part of truck owners generally; including farmers, loggers, local delivery, intrastate and long haul commercial operators. The 18,000 pound state axle limit was not a familiar law to the average truck owner; and it had been difficult for him to determine his axle loads (see Fig. 3). It is found that the vast majority of owners are anxious to comply with this law, once it is understood, and provision is made for determination of actual axle loads.

ITE CALENDAR

24th ANNUAL MEETING
Hotel Statler
Buffalo, New York
September 27 - October 1, 1953

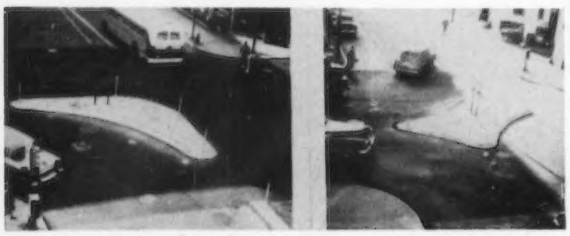
25th ANNUAL MEETING
Kansas City, Missouri
September, 1954

Open Discussion

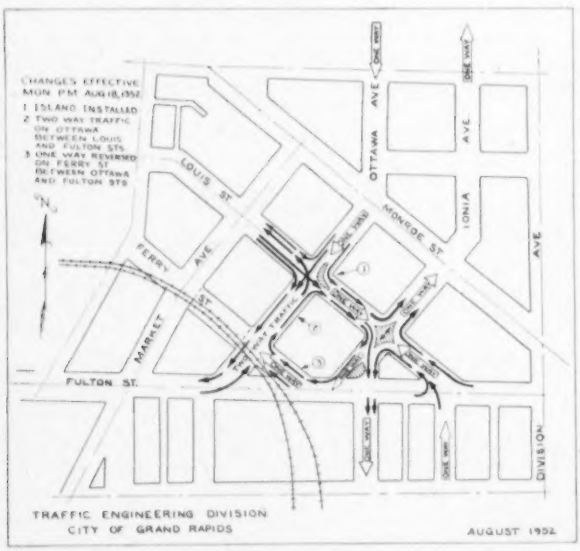
By Jerome D. Franklin (Assoc. Mem., ITE)
City Traffic Engineer, Grand Rapids, Michigan

I BELIEVE IN THE August 1952 issue of TRAFFIC ENGINEERING there was an article with regard to "breaking up through traffic by means of having each intersection consist of two one-way streets leading to the intersection and two one-way streets leading from the intersection."

I was most pleased to notice the coincidence of this type of control with the actual adoption of a similar system at one of our intersections in order to permit the continuous flow of one-way through traffic despite an irregular street pattern. As shown on the enclosed sketch, considerable changes were adopted in our downtown street pattern on August 18, 1952. As mentioned above an order to permit the continuous one-way flow of the north-south through streets for several miles was issued. In order to do this it was necessary to construct three islands which first consisted of concrete mushrooms and which, more recently, have been replaced with regular channelization as shown on the enclosed photos.



The intersection of Ionia Avenue and Louis Street (second photo) consists of the pattern of four one-way streets—two leading away from the intersection and two leading to the intersection. It is also possible with this type of control to permit vehicles to flow during one part of the cycle and to have pedestrians walk during the remaining part of the cycle.



TRAFFIC IMPACT OF THE REGIONAL SHOPPING CENTER

(Continued from page 194)

though, it is necessary to determine the distribution of shopping center traffic over the trade area road net. A detailed economic analysis will subdivide the trade area into districts—usually census tracts—and note the amount of expected trade from each district. These amounts can then be traced over the most logical routes to the shopping center.

Proportional road volumes thus obtained can be converted to actual cars per hour for each day from the curve of operations. Design peaks are then worked out based on seasonal fluctuations, duration of peak loads, acceptable congestion, etc. These loads compared with the unused road capacity will indicate whether or not improvements are required.

G. Highway Financing

At the conclusion of no matter how detailed and realistic a traffic analysis, the effort has only begun. Yet undone is the construction of the highway improvements required. In fortunate cases, where little road work is required, the shopping center developer may undertake the improvements at his own expense; but, in other cases, this is financially impossible and, where land acquisition and the right of eminent domain are necessary for street widenings, it is clearly beyond the scope of private enterprise.

Public funds and public authority are mandatory for extensive improvements. The problem is not that governing officials deny the feasibility or responsibility of providing the necessary improvements, or that there is a feeling that these improvements should be the responsibility of the shopping center management or the shopping center tenants or the shopping center customers. The problem is, rather, that hardly ever are there funds available for the improvements at the time they are needed. Most cities have extreme difficulty in keeping abreast of the traffic problems created by the store-by-store growth of a retail area. The cost necessary for road improvements for fifty stores at once is simply not in the yearly budget.

Even though the municipality may be well aware that the tax returns from the shopping center itself and its influence on surrounding land values will pay for the highway improvements, they are not able to build them until the tax money is paid. And, unfortunately, the shopping center must have the improvements *before* it can operate efficiently or even maintain itself. There are financial methods which, if the magnitude of the problem were realized by all (amazingly enough, some shopping center developers themselves are unaware of the traffic significance of their project!) could be utilized. There are bond issues—a good portion of which might well be subscribed to by the shopping center itself. Or, if the financial status of the developer is such that he could contribute funds for highway improvement, he may be repaid by some form of tax exemption. Under certain circumstances, a portion of the program may be eligible for federal or state aid. The exact nature of each situation would, naturally, have considerable bearing on the financing method but the importance of the problem is such that a suitable method must be found if the regional shopping center is to become an effective part of our new city pattern.

There are no compromises with quality in the making of a Karpark. For example, every shaft, pinion and gear is machine cut and finished to extremely close tolerances. No cheap stamping methods are ever used. The result is great precision, great performance.

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There are many reasons why far-sighted city officials choose a Karpark Parking Meter. Features, yes, Karparks have all that are worthwhile—from easy convertibility to automatic operation. But the most important reason is the way a Karpark is made. Reliability, accuracy, sturdiness, long life are built in by master craftsmen who maintain a reputation for superior excellence that extends over three generations.

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TRAFFIC NEWS

Federal "Emergency" Automotive Excise Taxes Exceed $2 Billion In 1952

Gasoline Tax Alone Exceeds Total Excise Receipts of 1945

In 1952, for the first time in history of the Federal Automotive Excise Taxes, receipts have exceeded $2 billion. According to the monthly reports of the Bureau of Internal Revenue, the total was $2,100,066,269.39.

Gasoline tax receipts alone amounted to $851,538,127.04, or more than the total received from all Federal "Emergency" Automotive Excise Taxes for any year prior to 1946. In 1945, the high point to that date, total receipts were $832,863,000.

Diesel fuel used in highway vehicles, the newest of these taxes, brought in almost $15 million, accounting for $14,682,784.14. Total fuel taxes for the year were $866,220,911.18.

By sources, the BIR reports show the following receipts:

Gasoline	$ 851,538,127.04
Diesel Fuel	14,682,784.14
Lubricating Oil	92,288,893.09
Automobiles and Motorcycles	601,852,128.07
Trucks, Buses and Trailers	187,837,455.54
Tires and Tubes	164,510,037.62
Parts and Accessories	187,356,843.89
Grand Total—1952	$2,100,066,269.39

It must be pointed out that this figure is the total received by the Federal government from these sources, and are not representative of the highway user portion. It is certain, however, that the users' share of the Federal Automotive Excise Taxes for 1952 will exceed the total received by the government in any previous year.

When You Change Your Address

. . . please notify us promptly. Your copies of "Traffic Engineering" will then reach you without delay and without interruption.—Traffic Engineering Magazine, Strathcona Hall, New Haven 11, Conn.

Grote Company Introduces New Reflective Sheeting

The Grote Manufacturing Company of Bellevue, Kentucky, has recently put on the market a new flexible reflex reflective sheeting, under the trade name GROTELITE SS (Smooth Surface). The material which reflects light rays back to their source is reported to be very effective for both day and night time signs of all kinds.

Its surface is uniformly covered with minute lenses (26000 per square inch) which are integral with the surface giving it the long range visibility so important for signs and markers for highway programs being engineered for today's fast moving traffic, and for effective roadside advertising. It has a hard smooth finish suitable for sign processing by the silk screen method, spraying, or brushing. The manufacturer states that signs made with GROTELITE SS bonded to the usual sign backing materials have successfully withstood tests under the most extreme weather conditions.

Mandatory Equipment Proposals Considered In Thirty-One States

Two-thirds of the 44 State Legislatures meeting in regular session this year are considering legislative measures to require additional approved equipment on motor vehicles, a National Highway Users Conference survey reveals.

Mudguards appear to have captured the interest of legislators in 13 states. Bills in Arkansas, Connecticut, Indiana, Iowa, Kansas, Massachusetts, Missouri, New York, South Carolina, South Dakota (passed House), Tennessee, Utah and West Virginia would require such devices on trucks and trailers unless the throwing of mud and water on following vehicles is prevented by means of fenders or other body construction. South Carolina and Tennessee proposals would apply only to those vehicles with dual wheels on the rear. Kansas would limit its requirement to gravel and dirt roads. Missouri would require them on all commercial vehicles. The New Jersey Attorney General has recently ruled that that state's mudguard law applies to non-residents as well as residents.

The trend toward requiring TURN SIGNAL devices on motor vehicles continues with activity shown in 12 states. Proposals in Connecticut, Maryland, Missouri, Nebraska (trucks and buses), New Jersey, North Carolina, Pennsylvania, South Dakota (passed both Houses), Vermont and Wisconsin would require the installation of turn signals on all motor vehicles manufactured or assembled after certain dates. A Kansas bill would require them on all trucks. Missouri and Nebraska measures would specify the use of such devices when the distance from the center of the steering post is more than 24 inches from the left side of the body or load, or if more than 14 feet from the rear limits of the body or load. An Indiana bill would legalize the use of directional signal devices.

The two Dakotas are considering bills to require SAFETY GLASS in all motor vehicles manufactured and sold after July 1, 1953. Vertical EXHAUST PIPES, extending above the cab, would be required on Diesel vehicles by proposals in Connecticut (buses), Indiana, Massachusetts and Minnesota (in first class cities). Georgia would require MUFFLERS on all motor vehicles. California would require trucks of an unladen weight of 6,000 lbs. or more and all truck-tractors to carry two CHOCK BLOCKS while Massachusetts proposes carrying "bricks or other objects" in fluid drive vehicles.

The perennial proposal in Massachusetts for two POLARIZED HEADLAMPS supplemented by two auxiliary non-polarized passing lamps and one polarized viewer, has again been introduced. The act would become effective when the Governors of three-fourths of the States approve similar legislation.

Providence, R. I., Parkers Walk To Save

Providence's Traffic Engineer Dwight Myers has found that people in Providence are willing to walk from a good parking space a much longer distance than traffic engineers heretofore thought. The story is told in the following clipping taken from the *Providence Evening Bulletin* of November 29, 1952:

Providence drivers will walk a long way to use a parking space that can be hired at rock-bottom prices.

They'll walk more than twice as far as traffic experts have estimated a driver will travel between his parked car and destination.

City Traffic Engineer Dwight T. Myers came up with this fact from a hatful of statistics on parking habits of drivers who use the city's Pershing Square Parking Plaza.

Average walking distance between the plaza and destination of 923 drivers interviewed in one 10-hour day was 1590 feet. The experts have said about 700 feet is the longest distance a parker will walk.

Walk Half-a-Mile

Many of the 923 drivers walked 2400 feet or more—almost one-half mile. Distances were measured from the center of the plaza to the center of the destination block.

Ability to park four hours for only 15 cents was cited among the reasons why parkers headed for the plaza. Thirty per cent of the parkers said they had given up former spots in favor of the plaza because of the cheaper rates.

The report to Myers on the survey made November 18 between 8 A.M. and 6 P.M., made this added observation:

"It seemed to interviewers that many were reluctant to admit they had changed because it was cheaper and said instead that it was more convenient."

54 Per Cent Cite "Convenience"

Of the total, 54 per cent listed the "convenience" as the reason for changing to the plaza. Nine per cent attributed the shift to the fact they can lock their cars and take keys with them.

Two per cent changed because they did not have to worry about fender dents that might be caused by attendants. Five per cent changed because they could park longer at the plaza than at curb sites.

One-third of the motorists said they drove their vehicles into the downtown business center more often because of the additional parking that has been made available in the plaza.

This group claimed they made 3.15 average additional trips each week because of their certainty that there would be a space for them in the year-old facility.

37 Per Cent Left Public Lots

In finding out why drivers moved to the plaza for parking, the traffic engineering staff quizzed them on where they had parked before the plaza was opened. Here's the result of the study:

At the curb—52 per cent; in public lots—37 per cent; in private lots—10 per cent, and in garages—one per cent.

The 10 per cent loss of private lots stemmed from the fact, drivers reported, that their offices had been changed to other buildings with a resulting loss of free private space.

Before the lot opened, 11 per cent did not drive downtown. An unusually high total of 87 per cent walked to the city. Only nine per cent used a bus. Four per cent rode with friends.

Why did they come downtown? The results follow:

Half On Business

One-half came on business. Eighteen per cent came to work. Shopping accounted for 26 per cent. Only five per cent came for pleasure. Miscellaneous reasons were given by one per cent of the drivers.

In addition to the spot-check earlier this month, the department made two surveys in May.

In the first check in the spring, 900 vehicles were found to be parked for more than five minutes. Average time was two hours and 17 minutes. A total of 118 parked overtime with an average stay of five hours and 44 minutes.

In the second survey, 712 cars were found parked with an average time of one hour and 52 minutes. A total of 62 vehicles parked overtime for an average stay of five hours and 39 minutes.

Sixteen of the first 118 violators were identified in the list of violators checked on the second survey.

The statistics made public by Myers constitute the latest study by his department. Established more than a year ago as a major public facility, the plaza is watched carefully to observe parking habits.

It already has established itself moneywise. Revenue from the 314 metered parking spaces has been averaging between $900 and $1000 each two-week collection period.

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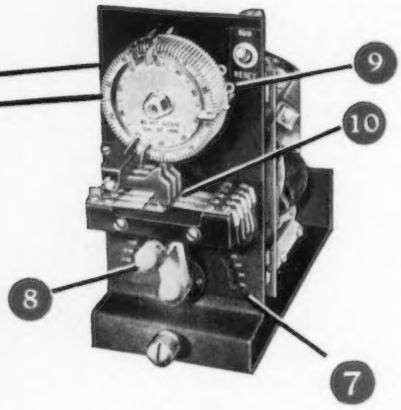
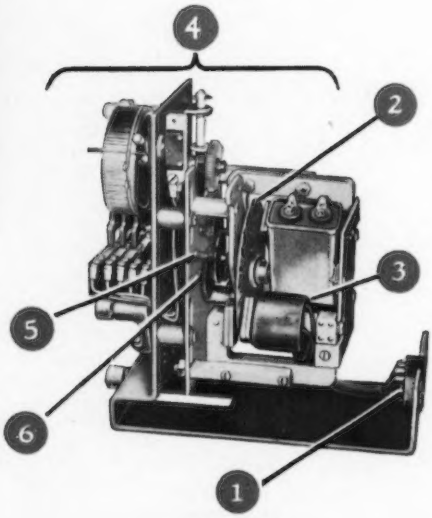
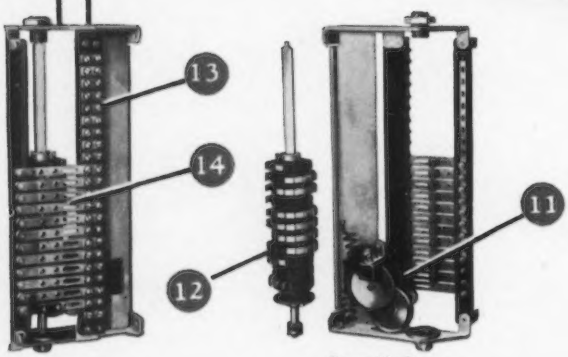


Dial-Unit
Enlarged Front View



Dial-Unit
Enlarged Side View



Cam-Unit
Right Side

Cam-Unit
Cam Shaft Removed
Left Side

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Type LS Synchronous Controller

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At any location where a single-dial controller is adequate today, but where a more complex controller may be required in the future, the Crouse-Hinds Type LS Synchronous Controller makes an ideal installation. It can be supplied for non-interconnected, future-interconnected, or interconnected operation.

The Crouse-Hinds Type LS Synchronous Controller differs in its basic construction from controllers of conventional design. In the Type LS Controller, each timing-dial with its driving motor is constructed as an individual unit. All dial-units are jack-mounted to the controller assembly, and may be quickly and easily removed.

The Type LS Controller can be supplied with 1, 2, or 3 dial-units. Each dial-unit can be set for a different time-cycle, a different timing-split and a different offset. All controllers have provision for three dial-units regardless of the number of units initially purchased. Therefore, the Type LS Controller is ideal where a single-dial controller is sufficient at the time of installation, but where future needs may call for additional dials.

The Type LS Controller may be purchased with 1, 2, or 3 resets on each dial-unit. When shipped from the factory, all dial-units are wired for 3 resets. Reset 2 and reset 3 may be added in the field to single-reset dial-units by simply installing dial contacts and switch arms. It's as easy as that!

Important Features of the Dial Unit

1. Jack-mounted quickly-removable from the controller assembly.
2. Disc-type synchronous motors provide high-torque with proven reliability.
3. Electro-dynamic braking assures accurate maintenance of offset.
4. All parts readily accessible for inspection and maintenance.
5. Heavy-duty bearings used throughout.
6. Long-wearing, precision-cut reduction gearing.
7. Full-length visual scale shows time-cycle in use.
8. Latch-in gear shift assures exact engagement with dial gear.
9. Precision dial with retaining ring—timing keys are locked in position.
10. Dial-contact assembly especially designed for easy maintenance.

Important Features of the Cam Unit

11. Motor-driven for greater flexibility, smoother operation, and longer life.
12. Replaceable cam lobes assure unequalled color sequence and interval flexibility.
13. Fifteen circuits wired complete.
14. Heavy-duty color-circuit contacts rated at 10 amperes, 115 volts.

The Type LS Controller is built to Crouse-Hinds high standard of quality from the finest materials by skilled workers. It will solve many of your traffic problems.

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Highway Problems Highlighted in Governors' Messages To State Legislatures

America's highway crisis and overlapping taxes at Federal, State and local levels have prompted numerous Governors to make various recommendations to aid the states to obtain additional funds to provide adequate highways. Many of the Governors, in their inaugural addresses or messages to the legislatures, have been outspoken in their demands for a review of Federal, State and local tax structures. Among highlights of the gubernatorial messages were the following:

ARIZONA: The Governor told the legislature a forthright approach by Congress to the whole question of taxation and overlapping fields of taxation can be expected. He suggested that the legislature memorialize Congress to abandon the entire field of automotive excise taxes.

DELAWARE: The retiring Governor stated that Delaware has the highest per capita income of any state in the nation. During the fiscal year ended June 30, 1951, the people of Delaware paid to the Federal Government $211,582,000 and received from the Federal Government in that same fiscal year $5,765,000. The incoming Governor, Caleb Boggs, emphasized that a strong state government which operates effectively in all its various fields of activity is the best deterrent to an overly centralized and all powerful Federal Government.

IDAHO: The legislature was told by the Chief Executive "the Federal Government has become a voracious monster, overlooking nothing in its insatiable hunger for greater revenue. . . . I am convinced that some agreement must be reached, by the Federal and State Governments, with respect to a division of tax sources . . . Federal Government can only distribute to a state a part of the money collected from that state, for no government can produce wealth. . . . For example, the Federal tax on three items: gasoline, distilled spirits and cigarettes consumed in Idaho amounts to more than our total Federal grants-in-aid for all purposes". The Governor said that administration of the present ton-mile tax law "is involved and costly." He recommended substitution of graduated fixed license plate charges for all vehicles with modifications for vehicles with "exceptional intrastate mileage."

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IOWA: The legislature was urged by Governor Beardsley to adopt a joint resolution memorializing Congress to enact laws returning to the states taxes now levied against road users. He has telegraphed the Governors of every State in which legislatures are now in session, urging them to take similar action.

NEW HAMPSHIRE: The Governor said there is a "probability that the Federal Administration will give new leadership to the working out of an agreement for a clear-cut division of tax authority between it and the individual states."

NEW JERSEY: Governor Driscoll declared "this is a proper and perhaps an auspicious time to reappraise the relationship between the various levels of government in the firm hope that such a re-examination of the business of government in this country, followed by appropriate action by Congress and State Legislature, may make it possible for us (1) to strengthen and preserve American principles of government, including the restoration of a working federalism in this country; (2) conserve tax dollars, thereby securing less government and better government for less money; (3) conserve the time and energy of our executives and legislators, both State and Federal, by the elimination of a major portion of the divided responsibility that presently exists in many fields of governmental endeavor, including duplication of services and administration and competition for the same tax dollar; and (4) provide for the effective performance of essential governmental services by the agencies best equipped to perform those services.

NEW YORK: Governor Dewey said the Federal Government soon may be reexamining its fiscal relationships with the states. "This re-examination may result in a reversal of some of the centralizing trends in Federal Government of the past two decades. It may be that the Federal Government will want to relinquish some of its present tax resources in favor of the states, so that the states will become less dependent on Federal aid. If that happens we shall want to be prepared. The Empire State should make sure that its fiscal house is in order and that it will be able to participate as a full partner in any possible changes in Federal-state fiscal relations."

UTAH: The Governor stated, "I proposed at one time than an even better solution to the Federal-aid and tax problem might be to eliminate the Federal Government from the direct taxation field, except in those instances wherein the collection of a tax is primarily a Federal burden; give to the States the responsibility of tax collection, and grant authority to the Federal Government to assess each State a proportionate share of the cost of Federal operations. If feasible, such a program would drive home to the people the high cost of Federal bureaucracy, and the fallacy of many Federal-aid programs, more quickly than any other plan I know. As yet, not enough attention has been given to the detail of such a program to test its soundness; nevertheless, I commend it to you for consideration as the possible basis for another resolution to Congress."

WYOMING: The Chief Executive stated that "should we relax our vigilance in the slightest degree, . . . there is an army of political masterminds called 'Economic planners' which would chart a destiny of bondage for use and 'lead us down the road' of planned economy into socialism and communism. Our national and state legislative bodies must remain eternally vigilant for this thing must not happen to us."

Highway Improvement Urged By Most Governors

Almost every Governor has devoted major attention in his message to the Legislature to the problem of inadequate highways. The following are typical of the views and attitudes of the various chief executives:

Governor Howard Pyle of Arizona recommended reorganization of the Highway Commission and increasing its membership to seven. He urged establishment of a committee of citizens to explore the entire matter of highway financing.

Governor Francis Cherry of Arkansas said there is no dispute of the fact that better main highways and farm to market roads "would bring more commerce, produce more wealth and thus improve the living standards at all levels in our population."

Governor Earl Warren of California stated the lack of adequate highway facilities is a costly condition. He urged provision of $1 billion over a period of ten years to provide for the state's highway deficiency.

Governor Dan Thornton of Colorado recommended issuance of anticipation warrants to be paid by future highway user tax revenues.

Governor Herman Talmadge of Georgia said his state is far ahead of an administration pledge to build 10,000 miles of highways and post roads by January 1, 1955.

Governor William S. Beardsley of Iowa said the state's pay-as-you-go highway program adopted four years ago has brought great improvements. He said the citizens must be advised that any further acceleration of highway construction or improvement will require additional funds which the people must provide.

Governor Edward F. Arn of Kansas requested the legislature to preserve the policy of refusing to divert highway funds. This would continue to implement "our long range objective of bringing our highways, roads and streets closed to the proved needs of the times."

Governor Burton M. Cross of Maine recommended placing the Highway Commission on a policy making, fact finding and review board basis. The State Highway Department is set up to operate within existing revenues and includes the continuance of an accelerated construction program authorized by the last Legislature.

Governor C. Elmer Anderson, of Minnesota proposed creation of a commission to launch an immediate survey with the objective of bringing the road systems at the various levels of government into proper relationship and developing "plans for a balance in financing such roads."

Governor Robert B. Crosby of Nebraska promised there would be no "political" roads built. "To the limit of my ability there will be a planned program of road construction and repair based on priorities that can be defended as best serving the general public need.

Governor Alfred E. Driscoll of New Jersey urged that the Highway Department should be given a greater opportunity to build limited-access highways and freeways.

Governor William B. Umstead of North Carolina stated "Good roads are a modern necessity." He recommended that the legislature look into the entire road situation and determine a long-range primary road building program.

Governor Christian A. Herter of Massachusetts declared himself to be in favor of continuance of an intelligently planned highway construction program. He expressed the intention of making a complete review of all current plans for construction, to make certain that the projects needed most will begin promptly.

Governor Johnston Murray of Oklahoma said there is no need to be ashamed of the State's highway system, but the highway program must be continued until it is brought to the proper high standard.

Governor John S. Fine of Pennsylvania said the State has a well-balanced program of highway construction. He continued, "It still remains the responsibility and the duty of government to provide adequate free highways where feasible."

Governor Dennis J. Roberts of Rhode Island declared "Because the opportunities we will have ten years from now are in great measure determined by the roads we build today, there is no area of government which calls for more careful planning than highway development."

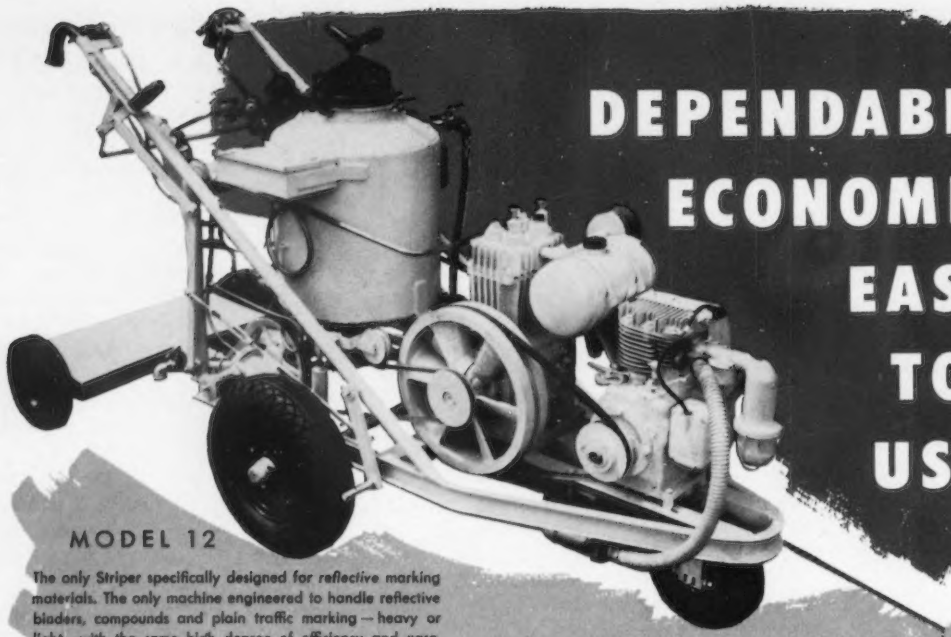
Governor Sigurd Anderson of South Dakota said that one of the major problems of the State is financing an adequate highway program, but expressed the belief that the State is making "commendable" progress in highway building and maintenance.

Governor Lee E. Emerson of Vermont praised the Highway Department for "an outstanding job." He said the matter of an adequate highway program would be dealt with in a later message.

Governor Arthur B. Langlie of Washington said that tremendous improvements have been made by the Highway Commission in the past two years. "Yet, as we survey the continuing, expanding usage of our highways, the increasing population and vehicular travel, we are constantly aware of the pressing need to build more highways as rapidly as possible."

Governor Walter J. Kohler of Wisconsin pointed out that despite increased efficiency in highway planning, "the astonishing expansion of automotive transportation since the end of World War II has outdistanced both our planning and our present resources." He said the State must maintain the present system of secondary roads, "and make more adequate provision for through traffic."

Governor C. J. Rogers of Wyoming stated that any legislation for improvement of primary or secondary roads will be of great benefit to the entire State. "You can make no greater contribution to the welfare of our citizens than to enact legislation that will improve and increase the road facilities of the ranchers and farmers of our State."



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Fowler Wins ACSC '52 Award

A city traffic engineer, whose novel warning device for fast-moving traffic on a busy boulevard prevented scores of rear-end collisions on curving sections with "blind" approaches to signalized intersections, was honored February 18, 1953, by the Association of Casualty and Surety Companies for the best traffic engineering example of 1952 showing how accidents can be reduced by traffic officials with "know-how."

Fred T. Fowler, City Traffic Engineer of Portland, Ore., won the Association's $100 award in its fourth annual program among the nation's engineers, police and traffic officials for the best illustration of a successful project published in its public service bulletins, "Getting Results Through Traffic Engineering."

Mr. Fowler worked on the principle that "an ounce of prevention is worth a pound of cure" when a four-lane arterial highway, Barbur Boulevard, was signalized in a joint city-state project. Realizing that rear-end collisions were the most common type of traffic accident in Portland, with half of them caused by sudden stops for traffic signals, he devised an unusual method of warning drivers on the curving boulevard of two traffic lights ahead that they couldn't see until they were "almost on top of them."

About 500 feet ahead of each of these two potential danger points, the Portland traffic engineer installed an amber blinker which was synchronized with the traffic light ahead when it was red or about to change to red. At each amber blinker he employed an additional warning of the "blind" intersection ahead—a sign reading: "Prepare to stop when this light flashes." As a result, both curving sections have experienced far fewer rear-end collisions than occurred on opposite approaches to the traffic lights where the sight distance is far greater.

In a three-year period after a synchronized flasher was installed for southbound traffic ahead of the Miles Street intersection, less than one-seventh as many rear-end collisions occurred on that curving section as there were in northbound boulevard travel approaching the intersection on the other side. Only 13 collisions occurred southbound, against 94 in northbound traffic. At a second location, ahead of the Hamilton Street intersection, Mr. Fowler's synchronized warning kept rear-end accidents in southbound traffic to 20 in the same period, compared with 58 in the northbound lanes which have far greater sight distance.

Public acceptance of the synchronized warning device resulted in many requests for additional installations on other streets, according to Mr. Fowler, who is a member of the Institute of Traffic Engineers, national professional group. He said plans are now being prepared to install the synchronized flashers at other locations on Barbur Boulevard that are not now so equipped.

Among other examples published last year in the Association's accident prevention department series of case histories, "Getting Results Through Traffic Engineering," were several projects which reduced accidents more than 50 percent. The bulletins are sent regularly to more than 2,000 traffic engineers, police and other traffic officials interested in ways to reduce traffic accidents and alleviate congestion.

A rerouting plan inaugurated in Winston-Salem, N. C., by Captain C. M. Stutts, of that city's police department, on the streets surrounding the Court House, effected a much freer traffic movement and at the same time drastically reduced accidents to pedestrians. Compared with 14 pedestrian accidents in nine years before rerouting was adopted, only two persons were injured within three years after the change was made, he reported.

J. W. A. Bollong, City Traffic Engineer of Seattle, Wash., and W. O. Shrader, Traffic Engineer of Montgomery, Ala., and his assistant, J. W. Chambliss, reported projects last year which reduced accidents 58 per cent at locations in those cities. In both instances, congestion and delay were reduced to a minimum. The Seattle improvement cut property damage accidents from 12 in two years before it was made to five in the subsequent two years. In Montgomery, compared to 36 accidents in the year before an intersection was redesigned, there were only 15 accidents in the 12-month period after the change was made.

In the Association's annual Award Program, major factors considered by the judges include effectiveness of a project in reducing accidents and traffic delay or congestion, and relationship of the value of benefits to cost of the improvement made.

Judges of the 1952 competition were representatives of leading organizations interested in traffic safety: American Association of State Highway Officials, J. Carl McMonagle, director, planning and traffic division, Michigan Highway Department; International Association of Chiefs of Police, Earl M. Larimer, chief, Minnesota Highway Patrol; Institute of Traffic Engineers, Paul L. Ristroph, traffic engineer, New Orleans Public Service, Inc,; National Safety Council, David M. Baldwin, director of its traffic and transportation division, and Yale Bureau of Highway Traffic, Theodore M. Matson, director.

Robert J. Allen, chief traffic engineer of the Association's accident prevention department, said more than 115 examples of successful applications of traffic engineering techniques have been published regularly in the "Getting Results" series during the last 14 years. The Association will make a similar $100 award next year for the best case history among the examples published during 1953.

3M Files Patent Violation Suit

Minnesota Mining and Manufacturing Co. of St. Paul has filed suit against the Streeter Manufacturing Corp. of Reseda, Calif., for infringement of eight patents in connection with reflective sheeting.

The 3M company's suit asks damages and an injunction against further infringement. It was filed in U. S. district court in Los Angeles.

The 3M company makes and sells reflective sheeting under the trademark, "Scotchlite". The material is used to reflectorize traffic signs in all 48 states, as well as being used on trucks, buses, trains, bicycles, and harbor buoys to make them brightly visible at night.

New Transportation Agency Created

The Department of Defense recently announced the establishment of a Joint Land Transportation Agency, with the Department of the Army as Executive Agent. It is headed by Colonel S. R. Browning, Army Transportation Corps. Three members represent the Army, Navy and Air Force. The Agency will plan for and execute coordination of employment of military land transportation, the military use of commercial transportation, the movement of military traffic overland to, or through, sea and aerial ports. It will develop plans to avoid congestion of roads, railroads, pipelines, waterways and terminals, during transportation emergencies declared by the Secretary of Defense.

New York City Revises 2-Section Signal Sequence

The operation of all two-color (green, red) traffic signals in the City will be changed so as to eliminate the dark period following the green signal, by substituting a combination of green and red to show that the signal is changing the right of way from one street to the other, Commissioner of Traffic T. T. Wiley announced today. This is the culmination of tests started in February, 1952, on three important arteries covering 57 intersections and later extended to approximately 1000 intersections. For several weeks, Department of Traffic personnel has been converting additional intersections and by the end of April over 6000 of the 7600 signalized intersections will have been changed.

The mechanisms controlling the signal indications at the 1600 other locations, about 1000 of which are in Manhattan, are obsolete and cannot be readily adapted to the new sequence. However, as part of the Department's signal controller modernization program, it is planned to replace the obsolete equipment with new controllers over the next 18 months, and the signal sequence will be changed as rapidly as the new mechanisms are installed.

"When the original tests of this new signal sequence were undertaken I pointed out that the dark period to be effective made it necessary for the driver to be looking right at the signal when the green went out if he were to be aware of the change," Commissioner Wiley stated. "In contrast to this, the green-red combination was eye-catching and would be more effective in appraising the motorist of the change period. This should result in better operation of the intersections and a favorable effect upon accidents."

Comparison of accidents reported at intersections on Horace Harding Boulevard in Queens and on Fourth Avenue in Brooklyn over a seven-month period after the change with the corresponding seven months before the change gave the following results:

	Before	After	Diff.
Horace Harding (19 intersections)	21	20	— 4%
Fourth Avenue (31 intersections)	45	37	—18%
Total (50 intersections)	66	57	—14%

Two of the 66 accidents before the change were fatal. There were no fatal accidents during the comparable period after the change.

"It is significant that there was a substantial decrease in accidents during a period when traffic volumes were increasing and when the city-wide accident rate was also increasing," Commissioner Wiley stated. "Observations have indicated that there are fewer quick stops and less squealing of tires. It is apparent that the green-red change period is doing a much better job than the dark period in warning motorists of the change in right-of-way. Naturally, this results in better traffic operation and reduced traffic hazards.

"Therefore, all two-color signals are being changed to include the green-red change period in place of the old dark period," Commissioner Wiley declared. "This work is being performed by Department of Traffic electricians and inspectors as part of their routine field activities. The change is quickly made at most intersections by use of simple tools. Those that cannot be quickly converted are scheduled for replacement for other reasons under our modernization program. Thus, the whole transformation with all its benefits will be accomplished at practically no cost."

In connection with the change in signal operation, Section 92, paragraph 4 of the Traffic Regulations has been amended by establishing the meaning of the green-red period as being identical with the dark period. The new wording follows:

Dark period and green-red combined following the green.—Vehicular traffic facing the signal is warned that the red signal alone will be exhibited immediately thereafter, and such vehicular traffic shall not enter the intersection when the red signal alone is exhibited.

Although the green-red change period is superior to the dark period, it is still not as good as the three-color signals with a yellow period. The Department's design policy for new installations calls for the use of the three-color (red, yellow, green) signal. Difficulties in obtaining new signals have delayed the effective date for this policy. However, deliveries of new signals are expected shortly so that most new installations from this time on will use the three-color signal.

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Positions Available

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ASSISTANT TRAFFIC ENGINEER
Requirements: Graduate Engineer with experience in traffic field; or experience equivalent to educational requirement.
Apply: Leroy J. Brenneman, City Personnel Director, Phoenix, Arizona.

CITY OF PHILADELPHIA
3 ASSOCIATE GRADE TRAFFIC ENGINEERS
Apply: Leslie H. Williams, Deputy Commissioner of Streets, 1001 City Hall Annex, Philadelphia.

CITY OF ALBUQUERQUE
CITY TRAFFIC ENGINEER
Graduate engineer with certificate in traffic engineering; or equivalent in experience.
Apply: Edmund L. Engel, City Manager, Albuquerque, New Mexico

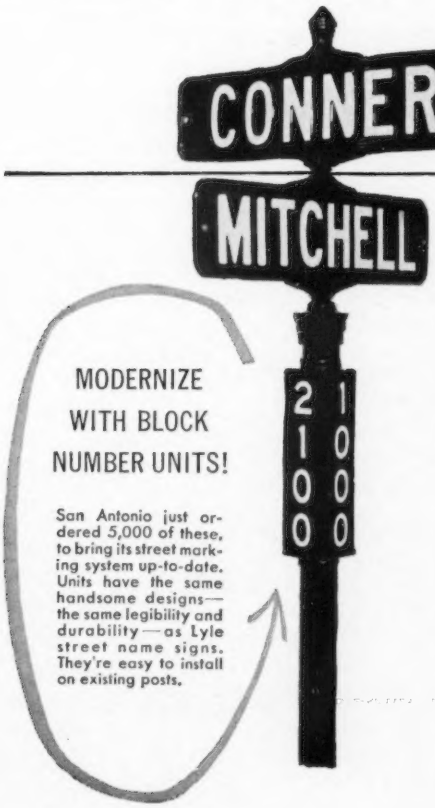
YOUNGSTOWN, OHIO
TRAFFIC ENGINEER
Minimum Qualifications: Graduation in engineering from an accredited college or equivalent experience and registration as a Professional Engineer. Specialized training in traffic engineering is preferred. Should have 4 years experience in traffic engineering with 1 year in responsible charge. Minimum age 25.
Address: Mayor Charles P. Henderson, City of Youngstown, Youngstown, Ohio.

CITY OF PITTSBURGH, PENN.
ASSISTANT TRAFFIC ENGINEER
Graduate engineer with 5 years experience in traffic engineering design, signal systems, public relations with city departments, civic groups, etc.
Apply: Michael J. Gittens, City Traffic Engineer, 908 City County Building, Pittsburgh, Penn.

CITY OF YAKIMA, WASH.
TRAFFIC ENGINEER
To head new traffic engineering division, establishment of which is under consideration by city authorities.
Apply: Grant E. Huey, City Commissioner of Public Works, Yakima, Washington.

CITY OF EAST ORANGE, NEW JERSEY
TRAFFIC ENGINEER
Graduate engineer with 1 year traffic engineering training; or equivalent experience.
Apply: Harry Hager, Acting City Engineer, East Orange, New Jersey.

CITY OF BEAUMONT, TEXAS
TRAFFIC ENGINEER
To head new traffic engineering division.
Apply: John D. Southwell, Traffic Director, City Hall, Beaumont, Texas.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Do you know this corner in San Antonio?

● One glance gives the exact location of this intersection in San Antonio, Texas. San Antonio planned it that way—this is one of 2,500 new Lyle 4-way units that proud citizens are installing to make it easy for visitors and neighbors to find their way.

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We believe that Lyle street name signs give you the best combination of desirable features. They have character, strength and stability. They are available in a variety of designs that will enhance the beauty of your streets—with a choice between Lyle Deep-Embossed or Lyle Carved-in-Metal letters. There is a complete line of posts, brackets and accessories.

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Everybody in your community. Traffic is everybody's problem. It affects every individual, every group and each classification of individuals . . . though each in a different way. For instance:

THE PUBLIC'S ANGLE The public wants the advantages of speed in transportation, convenience at destination and safety for himself, his family and his property.

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CITY MANAGEMENT'S ANGLE City and police officials are judged by their success in maintaining the fine balance between inefficiency and extravagance. In some cities traffic control absorbs as much as 60% of police attention. Metered parking relieves such conditions.

HOW PARK-O-METER provides the solution Park-O-Meter originated in the Traffic Committee of a Chamber of Commerce to meet a civic need. The idea took hold and today, in more than 900 cities PARK-O-METERS have proved highly effective in resolving and simplifying the traffic problem.

Our field engineers have had long experience in surveying on-street and off-street parking situations. We invite you to request suggestions and estimates without obligation on your part.

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New Appointments . . .

Dabney Heads Palmer & Baker Traffic Engineering Division

David F. Dabney (Assoc. Mem., ITE), Traffic Engineer for the City of Albuquerque, New Mexico, before his resignation December 15th, 1952, has joined the consulting engineering firm of Palmer and Baker, Inc., whose principal office is at Mobile, Alabama. Mr. Dabney heads the firm's Traffic Engineering Division.

David F. Dabney

Dabney was born in 1917 in Pensacola, Florida, from where his family moved to New Orleans shortly after. He was educated in the public schools of New Orleans to enter Virginia Polytechnic Institute to earn a bachelor's degree in civil engineering in 1940.

Serving briefly as Junior Traffic Engineer with the Louisiana Highway Department he enlisted in the U. S. Coast Guard in January 1941. In addition to sea service in the Pacific, Mediterranean and Atlantic theaters, he taught for a time at the Coast Guard Academy at New London, Connecticut, prior to his discharge in November 1945 as Lieutenant Dabney.

He received his certificate from the Yale Bureau of Highway Traffic in June 1947 and was immediately employed as Principal Assistant Traffic Engineer by the City of New Orleans. He moved on to Albuquerque in November 1950.

Dabney is registered as a professional civil engineer and land surveyor in both Louisiana and New Mexico. He admits that his chief hobby is helping Mrs. Dabney raise their three sons, ages 1, 3, and 5 years.

Bauch Is First Expressway Engineer In Illinois

The Illinois State Highway Department has appointed its first Expressway Engineer in the Chicago District where the State, Cook County, City of Chicago and the U. S. Bureau of Public Roads have combined to cooperatively build an extensive expressway system in the Chicago Metropolitan area. The first units of the system have been completed and since the State alone is responsible for expressway maintenance and operation the Highway Department has created a new organizational division to administer operation of the expressways after construction.

William F. Bauch, Jr.

William F. Bauch, Jr. (Assoc. Mem., ITE) was named to head the new division of the District setup in November, 1952 with the title of Expressway Traffic Engineer.

Bauch, born in Chicago in 1920, received his bachelor's engineering degree in 1941 following which he went to work as a transitman for the Inland Steel Company in Kentucky as a mine surveyor. He served in the armed forces from October, 1942 to May, 1946 when he returned to his Inland Steel work. In November of 1947 he joined the Bureau of Design of the Chicago District office of the State Highway Department.

From September, 1948 to June, 1949 he attended the Yale Bureau of Highway Traffic from which he received a Certificate in Traffic Engineering. Prior to his recent appointment he was the Assistant District Traffic Engineer.

Baltimore Loses Murphy To New York Auto Club

In a move to keep pace with the greatly expanded traffic engineering services it is providing to assist the communities within the 14 county area it serves, the Automobile Club of New York recently appointed Charles J. Murphy (Jr. Mem., ITE), former executive director of the Baltimore Traffic Commission, to head the newly created Traffic Engineering Department.

Charles J. Murphy

Mr. Murphy, who has been Baltimore's traffic engineer since 1947, assumed his new post with the Club on December 1, 1952.

Upon graduation from the John Hopkins School of Engineering, Murphy enlisted in the U. S. Navy and was commissioned an ensign shortly before the end of World War II. In the fall following his appointment by Baltimore in 1947 he was awarded a fellowship at the Yale Bureau of Highway Traffic from which he received his certificate in June, 1948.

Mr. Murphy's record is best told in the Baltimore Morning Sun and the Evening Sun editorials which appeared the day after he announced his resignation, herewith quoted in full:

A Municipal Position With Built-in Brickbats

Mr. Charles J. Murphy, the retiring traffic engineer, has had just one objective in his five years of work here: to get the fullest possible vehicular use, consistent with safety, out of existing Baltimore streets. His engineering axiom that streets are meant to carry traffic has led to a multiplicity of no-parking signs, one-way thoroughfares, progressively timed lights and boulevard designations.

He has aroused the ire of special and local interests, been denounced by city councilmen and crossed up by the Board of Estimates. But he has stuck to the point that the way out of traffic messes is to reserve the streets for traffic movement.

Engineers can be wrong, of course. But the engineering approach to traffic problems is infinitely more constructive than the emotionalized political approach which is apparent whenever the City Council takes up the discussion of where traffic lights should be installed. Like it or not, a large city requires a figure on high (a high horse, some say) who can consider traffic flow throughout the metropolitan area as a whole, apart from the desires of residents along a particular street to park in front of their houses and the wishes of other groups to have their own pet traffic lights.

Anyone appreciating the traffic advances here in the last five years can hope that Baltimore gets another trained traffic engineer with as tenable an axiom as Mr. Murphy has had, and a hide just as tough. A wishywashy character will not do at all in that job.

The Evening Sun's editor wrote:

Murphy's Departure

To find someone as well trained, as able and as industrious as Mr. Charles J. Murphy to take over the technical direction of traffic management is not going to be easy. Mr. Murphy has resigned as executive director of the traffic commission effective November 21 to take a similar position with the Automobile Club of New York.

In announcing his resignation Mr. Murphy has some kind words for the way Baltimoreans have responded to his efforts. He is leaving, he notes, not out of dissatisfaction with his present position but because the new job represents "an advancement in the profession" that he feels he cannot ignore. Recalling the protests when he was appointed traffic engineer in 1947 at the age of 23 and the storms provoked since by his determination to stick by a recognized procedure in traffic matters, his is a most charitable attitude.

In the five years under his direction the traffic commission has been under almost constant attack. In all this Mr. Murphy's outstanding virtue has been his patience in dealing not only with the public but with city officials who not infrequently let it be known that they were older and wiser than he. Largely as a result of his persistence we now have a recognized agency to study traffic management at one remove at least from the political turmoils of the City Council. Thanks, also, to Mr. Murphy we have become accustomed to the notion that such matters as the location of traffic lights are not to be decided on whim but by reference to certain standardized criteria. These are which will become ever more severe as the sound foundations for dealing with a problem city grows. New York's gain, as the Mayor has said, is indeed Baltimore's loss.

Chambliss Joins Alabama Highway Department

Jack W. Chambliss (Jr. Mem., ITE) resigned his position as Assistant Traffic Engineer for the City of Montgomery, Alabama, January 1, 1953 to become Assistant Traffic Engineer for the Alabama State Highway Department. His headquarters will continue to be Montgomery.

Jack W. Chambliss

Chambliss, born in Montgomery in 1924, completed high school there and entered the University of Alabama in 1942 from which he received his degree in engineering. While at the University he was a member of the noted "Million Dollar Band" and earned the greater part of his education expenses as leader of the college orchestra. Here he met Carolyn L. Jones who became Mrs. Chambliss shortly before his graduation.

His first job was in steel making industry at the Tennessee Coal, Iron, and Railroad Company's Birmingham plant. This plant is so huge that internal traffic was a problem. The new employee's first assignment was development of corrective measures to improve the plant's circulatory system. This excited his interest in traffic engineering, and when his home city looked for an assistant traffic engineer in June 1949 he was the successful applicant.

September of the following year found him enrolled at the Yale Bureau of Highway Traffic from which he received his certificate in June 1951.

In addition to his ITE membership he is a member of the Institute of Industrial Engineers, American Public Works Association, the Birmingham Engineers Club, and the Junior Chamber of Commerce.

Besides being a frustrated fisherman he has always continued his interest in music and plays the saxophone and clarinet well enough to win him a berth in the Montgomery Symphony Orchestra.

Now It's Colonel Simpson—Suh!

Hawley S. Simpson (Charter member and past-president ITE) of the engineering firm, Simpson and Curtin in Philadelphia, has been commissioned a Kentucky Colonel by Governor Lawrence W. Wetherby.

The Commission was conferred for the Governor by the Honorable Charles K. O'Connell, Secretary of State, at appropriate ceremonies in Frankfort on January 20, 1953.

LOOKING AHEAD

MARCH 30-31, 1953—BOSTON, MASS.
32nd Annual Massachusetts Safety Conference and Exposition, Hotel Statler.

APRIL 27-29, 1953—WASHINGTON, D. C.
Annual Meeting, Chamber of Commerce of the United States, Chamber Building.

JUNE 20-JULY 3, 1953—ATLANTIC CITY, N. J.
Summer General Meeting, American Institute of Electrical Engineers.

AUGUST 10-12, 1953—LOS ANGELES, CALIF.
Annual Meeting, American Transit Association, Hotel Biltmore.

SEPTEMBER 28-OCTOBER 1, 1953 — BUFFALO, N. Y.
24th Annual Meeting, Institute of Traffic Engineers, Hotel Statler.

SECTION NEWS

New England Section

In the absence of President Houston Wynn and Secretary Earl Flynn, the meeting at Hartford, February 17, 1953, was conducted by our able Vice President Robert Williston. Thirty-nine members and guests turned out to hear Mr. William Greene, Director of the Connecticut Safety Commission speak on the subject, "In Sheer Desperation." As there was no old business or new business Mr. Greene launched into his subject immediately after the dinner tab collection.

He brought out the fact that Connecticut was the safest State in the Union for road users in 1952. There was a 14% drop in traffic fatalities, 1000 fewer accidents and 1400 fewer personal injuries reported in 1952 than in 1951.

He went on to explain the organization and operations of the Safety Commission. He pointed out that it is a coordinating agency between state and towns and between state departments. Publicity is its prime tool in safety campaigning. Billboards, newspapers, radio, television, are the media used in its public relations program.

Mr. Greene advocated traffic engineers for all cities of over 50,000 population. He mentioned that city traffic engineers do not publicize enough what they are going to do. Therefore they do not get the public acceptance which is of prime importance in the city traffic improvement program. He emphasized the woeful lack in reaching the public with what we are trying to do for them. He felt that more could be done in publicizing the accident problem and recommended colorful and emotional treatment of accidents to bring the problem to the attention of the public.

The usual question and answer period was widely participated in by the members and guests.

Reported by David S. Johnson, Jr.
Secretary-Treasurer, *Pro Tem.*

New York Metropolitan Section

The third (luncheon) meeting of the 1952-1953 fiscal year was held at the Masonic Club. 25 members and guests were present. The minutes of the previous meeting were adopted as read.

Mr. Arnold G. Fisch, of the New York Thruway Authority, was the speaker of the meeting on the subject—"The New York Thruway". The talk was preceded by the showing of a film, depicting the progress of the work on the Thruway, the economic effects of the Thruway on motor transportation within and outside of New York State, and the recreational benefits to be derived by the residents of the state.

After the presentation of the film, Mr. Fisch described the various methods under consideration for the collection of tolls, some aspects of construction relating to safety and convenience of travel, and other problems in connection with the operation of the Thruway. A discussion followed, led by Mr. T. T. Wiley, Traffic Commissioner of New York City, of the effects of such highway facilities as the New York Thruway on the traffic problems in New York City and in other large cities along the route of the Thruway. Mr. Charles Murphy of the New York Automobile Club, suggested that a discussion meeting of the New York Metropolitan Section be arranged on this problem.

The discussion had to be terminated because of the lateness of the hour.

The next meeting will be held on March 23, 1953.

Reported by Nathan Avins
Secretary-Treasurer

Michigan Section

On February 3, 1953, a dinner meeting was held at the 40 and 8 Chateau in Lansing, Michigan. 57 members and their guests were present to enjoy the dinner and program put on by Ed Gervais, Barney Cyberski, Max Clyde, Ron Reed and Don Perkins. Barney's big grin was caused by the look of astonishment that came over the members' faces as they sank their plates into the delicious roast beef that he and his crew had prepared.

Harry Coons, Deputy Commissioner of the Michigan State Highway Department was the guest of honor at the dinner and was called upon for a brief message. He spoke of the State Highway Budget and the many problems we are faced with in getting our highways in good shape.

During the business meeting which followed, Jerry Franklin informed the group of two bills which were in front of the State Legislature. Bill No. 1037 was in regard to motor vehicle or trailer inspection prior to registration. After considerable discussion it was decided that our group go on record as being in favor of vehicle inspection in general, but not for this particular bill. Bill No. 1038 was in regard to the issuance of permanent drivers licenses to people having a ten year record of no accidents or moving violations. Our group was unanimously opposed to such a bill.

Carl McMonagle recommended that the Michigan Section discontinue its participation in the Michigan State Safety Conferences because of its industrial safety nature, and concentrate our efforts on the Annual Highway Conference and the Michigan Traffic Safety Seminar.

The next meeting is scheduled for the latter part of March to be held in Grand Rapids in conjunction with the Traffic Safety Seminar.

Ed Gervais then introduced Ken Stonax, Director of Technical Data, G. M. Proving Grounds, Milford, Michigan, who gave a technical discussion with the use of many interesting slides on the relationship of automobile and highway design. The presentation proved to be very interesting and resulted in considerable discussion at its conclusion.

The meeting was then adjourned to the refreshment parlor where "Uncle Oliver" presided in his own inimitable style.

Reported by Sven Kansman
Secretary-Treasurer

Yale Chapter Elects Second Semester Officers

The first meeting of the second semester of the ITE Yale Student Chapter was called to order at 9:30 A.M. February 5, 1953 by President Walter Macnee. It was decided to visit the Connecticut State Highway Department at Hartford on their invitation on Tuesday, February 17, 1953. All members will make the trip and many will stay for the New England Section meeting scheduled for that evening at Hartford.

Officers were elected for the second semester as follows:

Lowell Markert—President

Ted Olcott—Vice-President

Ed Mueller—Secretary-Treasurer

Hans Schwar—Entertainment Committee

Frank Heroy—Entertainment Committee

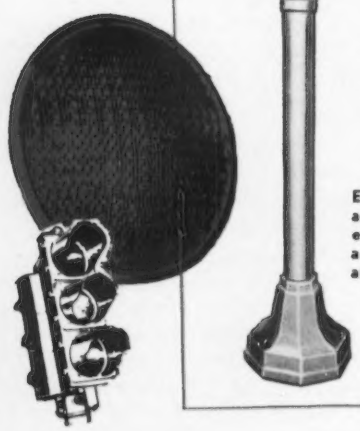
Eugene Avery—Entertainment Committee (Chairman)

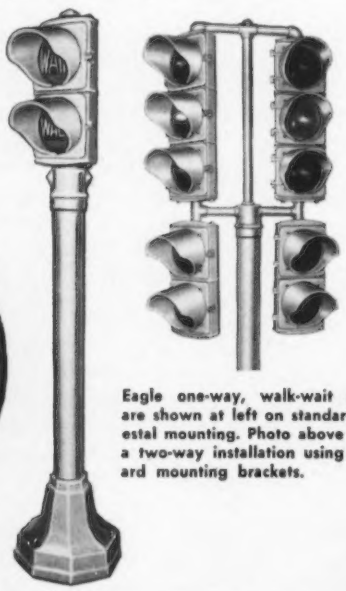
The new administration began auspiciously (in spite of a 62 cent treasury deficit left by the previous administration—which explains why the rascals were thrown out) by planning its future activities including a social party to be held February 27 at the Garden Restaurant on the Post Road.

New EAGLE

neon walk-wait signal or adapter kits

FOR SAFER INTERSECTIONS





Eagle one-way, walk-wait signals are shown at left on standard pedestal mounting. Photo above shows a two-way installation using standard mounting brackets.

COMPLETE SIGNAL UNITS

Eagle neon "WALK-WAIT" signals are available as complete signal units to easily install in connection with present traffic signals by means of standard signal mountings or on pedestals.

CONVERSION KITS

"WALK" and "WAIT" neon kits will fit in present EAGLE signal housings by removing standard optical units. All kits are complete assemblies including lettering, transformer and mounting panel. Green and red letters are available.

EAGLE SIGNAL
CORPORATION *Moline, Illinois*

Secretary's Column

The February issue of *Architectural Forum* carries the conclusions resulting from the round table discussion of the urban congestion problem by 42 top flight spokesmen representing various business, government, and professional groups ranging all the way from architects to department store owners, from city planners to parking garage operators, from traffic engineers to fleet operators and from city officials to automobile manufacturers.

The joint statement, if not the first, is certainly one of the most comprehensive by the many diverse interests on a suitable and realistic traffic relief program. It is the outcome of a two-day round table conference held earlier this year which was conceived and arranged by Mr. P. I. Prentice, Editor and Publisher of *Architectural Forum*, one of the *Time-Fortune-Life* enterprise's publications.

ITE members participating in the discussion included Hank Barnes, Bill McConochie, Jack Ecker, Hank Evans, Harold Hammond, Mer Kraft, Wilbur Smith and Harley Swift. We understand that some of these were quite vocal in disagreeing with some of the premises of the statement.

While not all traffic engineers will agree with all of the conclusions—just as some of the city planners, or the truck operators, or the store owners, will disagree in part—I believe that the traffic engineering profession is indebted to Mr. Prentice for his courageous effort to bring the views of so many diversant interests into sharp focus. Only in this fashion can the many differing motivations with which the operational traffic engineer must contend, be exposed for public appreciation. In addition to being in the public's interest, Mr. Prentice's Round Table Conference on urban congestion was definitely in the interest of the traffic engineering profession.

TIM TODD

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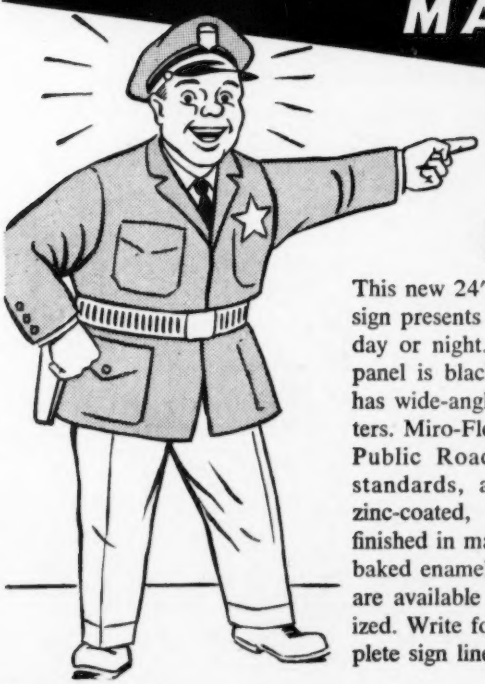

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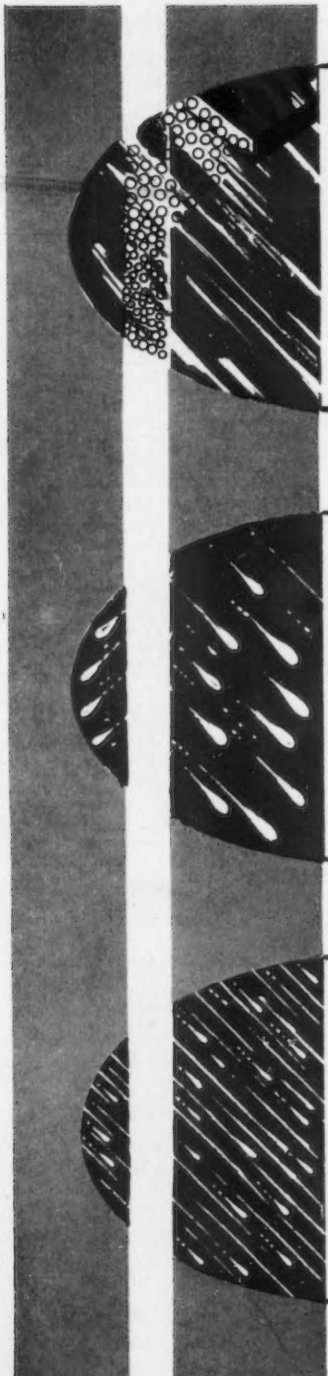

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